: 950/3

Vol. 950 Number 3

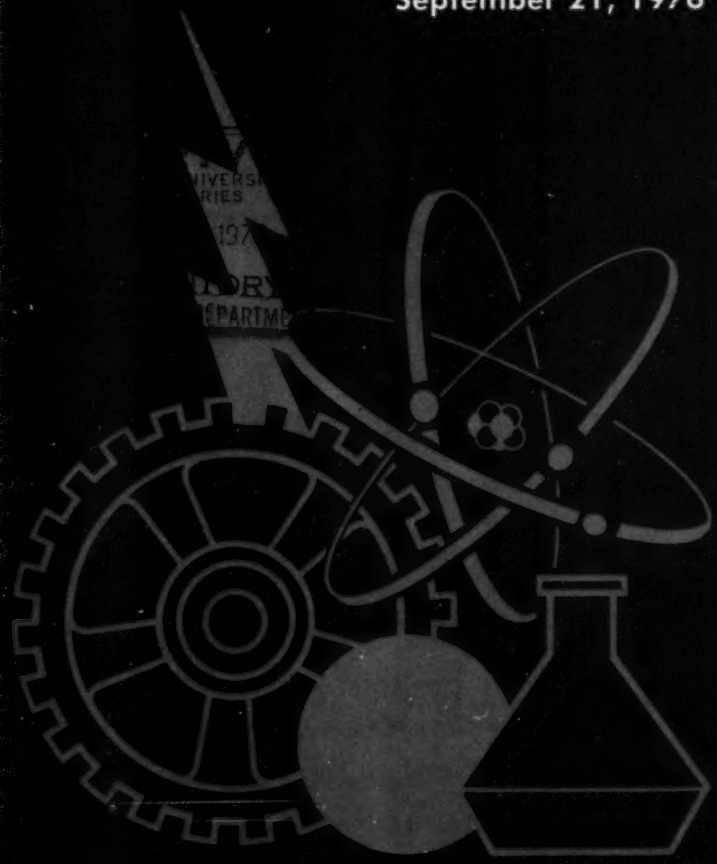
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 21, 1976



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

September 21, 1976 Volume 950 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

International Protection of Government Emblems and Seals

Change of Intent

The Patent and Trademark Office, Department of Commerce, intends to forward only the 50 State seals plus one departmental seal for each department listed in the publication "Seals and Other Devices in Use at the Government Printing Office" ("Seals") instead of the entire publication, as indicated on page 59366 of the Federal Register of December 23, 1975.

Since the publication had been printed in 1975, it was assumed that few deletions and additions would be necessary. However, the response to the above notice, along with some necessary deletions, resulted in a large number of seals in the publication requiring deletion. This rendered the publication unacceptable for submission to the World Intellectual Property Organization (WIPO).

Therefore, the Patent and Trademark Office now intends to forward only the 50 State seals along with the departmental seal denoted "No. 1" for each department listed in the "Seals" publication. If this is not the preferred departmental or State seal, the department or State involved is requested to notify the Patent and Trademark Office by September 21, 1976. This notification should either specify the number of the preferred seal, as it appears in the "Seals" publication, or provide a clear, black and white photograph, suitable for reproduction, of the preferred seal. The seal must be no larger than 1½ inches in diameter.

These seals will then be forwarded to WIPO for protection under Article 6*ter* of the Paris Convention for the Protection of Industrial Property.

Address all correspondence to: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Dated: August 18, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

[FR Doc.76-24724; Filed 8-23-76; 8:45 am]

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,900,150, Hirt and Martino. EJECTION SEAT CATAPULT; **3,115,320,** G. E. Hirt, same, **filed** Mar. 30, 1973, United States Court of Claims (District of Columbia) Doc. 78-73, *Talley Industries, Inc.* v. *The United States.* Judgment entered for plaintiff, Nov. 20, 1975.

3,052,319, R. K. Swanson, CANTILEVER SHOPPING CART AND COUNTER ASSEMBLY; **3,517,773,** same, CHECK-OUT SYSTEM AND COUNTER FOR USE WITH CANTILEVER SHOPPING CART, **filed** Dec. 5, 1975, D.C., C.D. Calif. (Los Angeles) Doc. CV-75-4082-LTL, *Zephyr Systems, Inc.* v. *Roblin Industries, Inc.*

3,087,005, Sabatino and Lowe, METHOD OF MAKING STORAGE BATTERY ELEMENTS; **3,229,339,** same; **3,238,-579,** same, METHOD OF MAKING BATTERY ELEMENTS; **3,242,012,** A. Sabatino, STORAGE BATTERY CONSTRUCTION; **3,303,056,** Sabatino and Orlando, BATTERY TERMINAL CONSTRUCTION, **3,313,658,** same, STORAGE BATTERY CONSTRUCTION; **3,364,076,** Buttke and Orlando, ALIGNING ARRANGEMENT FOR MULTICELL BATTERIES; **3,-388,007,** R. M. Fiandt, THIN WALL POLYPROPYLENE BATTERY CASE; **3,416,969,** V. M. Halsall, BATTERY CONSTRUCTION; **3,441,448,** METHOD OF MAKING AND SEALING AN ELECTRIC STORAGE BATTERY; **3,476,611,** A. Sabatino, INTERCELL CONNECTION AND METHOD OF MAKING SAME; **3,687,734,** Orlando and Smith, STORAGE BATTERY ELECTRICAL CONNECTORS; **3,897,269,** Sabatino and Orlando, STORAGE BATTERY CONSTRUCTION AND METHOD OF MAKING SAME, **filed** Feb. 19, 1976, D.C. Del. (Wilmington) Doc. 76-83, *General Battery Corporation* v. *Globe-Union, Inc.*

3,112,300, Natta, Pino and Mazzanti, ISOTACTIC POLYPROPYLENE, **filed** June 23, 1969, D.C. Del. (Wilmington) Doc. 3738, *Montecatini Edison S.p.A.* v. *Phillips Petroleum Company.* Consent order dismissing this action, Feb. 14, 1975. **Same, filed** June 24, 1969, D.C. Del. (Wilmington) Doc. 3739, *Montecatini Edison S.p.A.* v. *Diamond Shamrock Corporation.* Consent order dismissing action without prejudice to the parties, June 17, 1974.

3,115,320. (See 2,900,150.)

3,229,339. (See 3,087,005.)

3,238,579. (See 3,087,005.)

3,242,012. (See 3,087,005.)

3,285,546, D. C. Jalbert, MULTI-CELL WING TYPE AERIAL DEVICE; **3,724,789,** S. L. Snyder, RAM AIR GLIDE PARACHUTE; **Re. 26,427,** D. C. Jalbert, MULTI-CELL WING TYPE AERIAL DEVICE, **filed** Feb. 19, 1976, D.C.N.J. (Camden) Doc. 76-0304, *Domina C. Jalbert* v. *Para-Flite, Incorporated et al.*

3,303,056. (See 3,087,005.)

3,313,658. (See 3,087,005.)

3,364,076. (See 3,087,005.)

3,375,549, P. Geyer, METHOD AND APPARATUS FOR REFINING AND SEPARATING PLASTIC MATERIALS, **filed** Mar. 29, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c899, *Uniroyal Incorporated* v. *Midland Ross Corporation.* Stipulation of dismissal pursuant to F.R.C.P. 41 dismissing complaint and counterclaim without prejudice, May 15, 1975.

3,388,007. (See 3,087,005.)

3,409,579, J. Robins, FOUNDRY BINDER COMPOSITION COMPRISING BENZYLIC ETHER RESIN, POLYISOCYANATE, AND TERTIARY AMINE; **3,676,392,** same, RESIN COMPOSITIONS, **filed** Feb. 23, 1976, D.C., E.D. Wis. (Milwaukee) Doc. 76-131, *Ashland Chemical Company* v. *Delta Oil Products Corporation.*

3,416,969. (See 3,087,005.)

3,437,715, E. Da Fano, RESIN COMPOSITION; **3,840,618,** same, **filed** Apr. 15, 1976, D.C., N.D. Ohio (Cleveland) Doc. C76-384, *PPG Industries, Inc.* v. *The Standard Oil Co. and Vistron Corp.*

3,441,448. (See 3,087,005.)

3,476,611. (See 3,087,005.)

3,484,906, Sands and Broome, TUBING AND PIPING OF THERMOPLASTICS MATERIAL, **filed** Apr. 13, 1976, D.C. (District of Columbia) Doc. 76-0613, *Robintech, Inc.* v. *Wavin Plastics Ltd.*

3,517,773. (See 3,052,319.)

3,650,460, B. P. Lokey, PAPER BAG; **Re. 28,317,** J. J. Goodrich, GUSSETED TYPE BAGS; **Re. 28,318,** same, **filed** Aug. 20, 1975, D.C. Del. (Wilmington) Doc. 75-247, *St. Regis Paper Company* v. *Olinkraft, Inc.* Consent order dismissing this action, Mar. 2, 1976.

3,676,392. (See 3,409,579.)

3,687,734. (See 3,087,005.)

3,724,789. (See 3,285,546.)

3,840,618. (See 9,437,715.)

3,897,269. (See 3,087,005.)

3,927,456, R. H. Dammar, COIL WINDING MACHINE WITH IMPROVED WIRE GRIPPING AND CUTTING MEANS; **3,927,469,** same, METHOD OF WINDING ARMATURES, **filed** Dec. 29, 1975, D.C. Minn. (Minneapolis) Doc. 4-75-C-663, *Mechaneer, Inc.* v. *Possis Corporation.* Action dismissed, Feb. 18, 1976.

3,927,469. (See 3,927,456.)

Re. 26,427. (See 3,285,546.)

Re. 28,317. (See 3,650,460.)

Re. 28,318. (See 3,650,460.)

D. 227,722, M. A. Mendlin, COMBINED BED AND STORAGE UNIT; **D. 227,723,** same, COMBINED BUNK BED AND STORAGE UNIT; **D. 227,724,** same, COMBINED BED AND STORAGE UNIT; **D. 227,725,** same, COMBINED BUNK BED AND STORAGE UNIT; **D. 232,788,** same, COMBINED BED AND STORAGE UNIT, **filed** Feb. 5, 1975, D.C.N.J. (Trenton) Doc. 75–182, *Bunk Trunk Distributors* v. *Sleepworld, Inc.* Consent judgment for permanent injunction against defendants and counterclaim dismissed, Sept. 2, 1975.

D. 227,723. (See D. 227,722.)

D. 227,724. (See D. 227,722.)

D. 227,725. (See D. 227,722.)

D. 232,788. (See D. 227,722.)

D. 236,758, P. R. Sollazzi, LUGGAGE; **D. 236,759,** same, COMBINED LUGGAGE FLAP AND HANDLE, **filed** Dec. 5, 1975, D.C.N.J. (Newark) Doc. 75–2083, *Rapid-American Corporation* v. *M & M Luggage Co., Inc.* Consent judgment for permanent injunction, filed Apr. 13, 1976.

D. 236,759. (See D. 236,758.)

PATENT NOTICES

Certificates of Correction for the Week of Sept. 21, 1976

Re. 28,755	3,847,947	3,917,831	3,936,602	3,950,042	3,957,787	3,963,739	3,967,735
Re. 28,811	3,849,241	3,918,055	3,937,631	3,950,242	3,957,996	3,963,824	3,967,765
D. 240,270	3,853,881	3,918,658	3,937,748	3,950,527	3,958,260	3,964,055	3,967,799
3,557,351	3,856,155	3,919,169	3,939,119	3,950,641	3,958,732	3,964,126	3,967,843
3,562,968	3,856,539	3,921,490	3,939,193	3,950,703	3,958,771	3,964,413	3,968,212
3,565,792	3,857,525	3,923,774	3,939,777	3,950,751	3,958,961	3,964,677	3,968,298
3,664,991	3,859,733	3,923,918	3,939,807	3,950,926	3,959,353	3,964,923	3,968,691
3,666,862	3,859,776	3,925,341	3,940,147	3,950,944	3,959,563	3,964,925	3,968,944
3,669,957	3,868,852	3,926,399	3,941,161	3,950,973	3,960,471	3,964,949	3,969,451
3,679,792	3,875 212	3,926,704	3,941,301	3,951,320	3,960,653	3,965,092	3,969,483
3,698,851	3,876,802	3,926,776	3,941,825	3,951,484	3,960,736	3,965,100	3,969,523
3,733,163	3,880,779	3,926,944	3,941,939	3,951,555	3,960,911	3,965,101	3,969,686
3,735,353	3,885,673	3,927,695	3,942,157	3,951,926	3,960,985	3,965,207	3,969,736
3,758,999	3,887,565	3,928,341	3,942,354	3,952,748	3,961,069	3,965,259	3,969,851
3,763,544	3,888,431	3,928,699	3,942,373	3,953,207	3,961,094	3,965,669	3,969,955
3,777,270	3,892,435	3 928,777	3,942,474	3,953,422	3,961,657	3,966,119	3,970,093
3,789,027	3,894,180	3,929,907	3,942,556	3,953,469	3,961,701	3,966,474	3,970,157
3,789,403	3,895,253	3,931,351	3,944,554	3,954,573	3,961,803	3,966,484	3,970,225
3,790,908	3,896,150	3,931,393	3,944,557	3,954,797	3,961,905	3,966,597	3,970,332
3,804,531	3,901,746	3,932,994	3,944,643	3,954,899	3,962,301	3,966,652	3,970,369
3,812,140	3,901,806	3,933,764	3,944,666	3,955,251	3,962,396	3,966,706	3,970,384
3,812,644	3,904,078	3,933,765	3,944,947	3,955,896	3,962,443	3,966,810	3,970,553
3,818,125	3,904,514	3,933,977	3,945,980	3,956,701	3,962,512	3,966,945	3,970,617
3,820,167	3,907,517	3,934,142	3,946,489	3,956,867	3,962,583	3,967,097	3,970,849
3,829,311	3,907,798	3,934,167	3,946,777	3,956,877	3,962,595	3,967,388	3,971,389
3,835,192	3,909,808	3,935,141	3,946,884	3,957,078	3,962,653	3,967,428	3,971,743
3,836,594	3,911,442	3,935,209	3,947,266	3,957,733	3,962,721	3,967,614	3,972,626
3,840,544	3,915,140	3,935,463	3,947,575	3,957,748	3,963,225	3,967,651	3,973,200
3,845,144	3,917,477	3,936,546	3,947,760	3,957,774	3,963,491	3,967,679	

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 28, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-2-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-3-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	11-17-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-21-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	11-10-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-4-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	2-27-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-8-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-2-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-10-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-20-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-22-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-11-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-26-76

Expiration of patents: The patents within the range of numbers indicated below expire during September 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,901,749 to 2,907,036, inclusive
Plant Patents..... Numbers 1,861 to 1,869, inclusive

REISSUES

SEPTEMBER 21, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,965

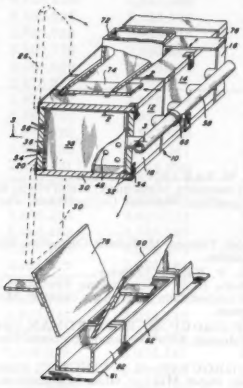
FLOW THROUGH TYPE DRYING APPARATUS

William H. Hamilton, Philadelphia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Original No. 3,238,638, dated Mar. 8, 1966, Ser. No. 178,356, Mar. 8, 1962. Application for reissue Feb. 29, 1968, Ser. No. 710,443

Int. Cl.[2] F26B *13/30*

U.S. Cl. 34—92 **9 Claims**



1. A product flow through drying apparatus comprising a regular parallelepiped housing, upper and lower ends of said housing having selectively movable portions so that products to be dried may be inserted into the housing from an upper end and removed from a lower end, an open ended container within said housing and supported thereby, said container being adapted to receive a product at its upper end and permit discharge of the product through its lower end, opposite sides of said container having apertures providing open communication between the interior of said container and the interior of said housing, heating panels juxtaposed to the apertured sides of said container for radiantly heating product within said container, said heating panels being disposed in spaced apart relation between the apertured opposite sides and the adjacent side walls of the housing, and means coupled to said housing for reducing the pressure within said housing and said container, said last-mentioned means including conduit means communicating with the interior of said housing through a wall perpendicular to the said adjacent walls, said conduit means being positioned on said perpendicular wall so as to be aligned in communication with the open space between said heater panels and said apertured sides of said container.

Re. 28,966

SYSTEM AND BARRIER FOR CONTAINING AN OIL SPILL

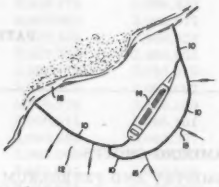
Thomas Nicholas Blockwick, McLean, Va., assignor to Ocean Systems, Inc., Reston, Va.

Original No. 3,708,982, dated Jan. 9, 1973, Ser. No. 79,997, Oct. 21, 1970. Application for reissue Jan. 24, 1974, Ser. No. 436,146

Int. Cl. E02b *15/04*

U.S. Cl. 61—1 F **19 Claims**

9. An oil containment barrier module [as defined in claim 7] *comprising a composite structure having a buoyant, substantially water impervious, upper section and a water absorbent lower section, said lower section when immersed in water representing concurrently the principal ballast for said upper section and the subsurface barrier for the module, wherein said upper and lower sections are formed from at least one material selected from the class consisting of flexible foam, porous rubber, and sponge, having low density, further comprising means for bonding said upper section to said lower section, wherein said upper section is encased within a substantially water impervious jacket,* wherein said lower section comprises two segments having adjacent surfaces, a relatively thin belt-like member located between said adjacent surfaces and means for bonding said member to said adjacent surfaces.



Re. 28,967

WORK LOCATING APPARATUS

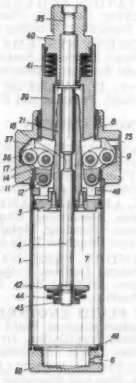
Dieter Weiss, Neckarweihingen, Germany, assignor to Weiss KG, Neckarweihingen, Germany

Original No. 3,812,766, dated May 28, 1974, Ser. No. 248,455, Apr. 28, 1972. Application for reissue Sept. 25, 1975, Ser. No. 616,844

Claims priority, application Germany, Aug. 5, 1971, 2139150

Int. Cl.[2] F15B *15/22*

U.S. Cl. 92—14 **22 Claims**



1. A work locating apparatus having a tension member actuated by means of a piston movable within a cylinder, particularly a pneumatic cylinder, via a starting stroke and a working stroke, in which said tension member is actuated with an amplified force by a mechanical step-up mechanism during the working stroke whereby said piston becomes releasable

from said tension member and said piston actuates on the one hand, said tension member directly via said starting stroke and on the other hand, said step-up mechanism via said working stroke, the improvement comprising swinging levers hinged on said tension member, each lever being provided with an abutment portion and a guide portion, said abutment portion being guided along the cylinder wall during the starting stroke, a collet coaxial with said cylinder, said piston being connected to said collet, said collet having wedge-shaped outer surfaces which cooperate with said guide portion of said swinging levers, and said cylinder being provided with an abutment surface positioned transversely to the axis of the cylinder with said abutment portions of said swinging levers being pressed against said abutment surface during the working stroke.

Re. 28,968

STEAM SUPPLY APPARATUS

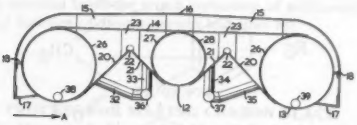
Norman F. Dove, Cranbrook, Canada, assignor to Devron Engineering Ltd., Vancouver, Canada

Original No. 3,777,781, dated Dec. 11, 1973, Ser. No. 300,490, Oct. 25, 1972. Application for reissue Dec. 5, 1974, Ser. No. 529,619

Claims priority, application Canada, Apr. 21, 1972, 140239

Int. Cl.² F26B *21/12*; **D21F** *5/18*

U.S. Cl. 137—608 **20 Claims**



1. A steam supply apparatus including at least two pipes located in spaced apart, side by side relationship, a cover member extending across the pipes and secured thereto, end members secured to the respective opposite ends of the pipes, a pair of baffles between each pair of pipes and secured thereto in a substantially V-shaped configuration with a slot between adjacent ends of the baffles, at the base of the V-shape, the base of the V-shape being directed towards the cover member, means for supplying steam to the pipes, and each pipe having a series of apertures communicating the interior of the pipe with the space between the pipes, the cover member and the baffles.

Re. 28,969

INTEGRAL RECLOSABLE BAG

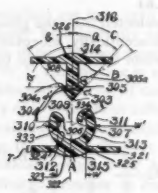
Kakuji Naito, Tokyo, Japan, assignor to Kabushiki Kaisha Seisan Nihon Sha, Ltd., Tokyo, Japan

Original No. 3,198,228, dated Aug. 3, 1965, Ser. No. 233,959, Oct. 29, 1962. Application for reissue Sept. 30, 1975, Ser. No. 618,165

Claims priority, application Japan, Nov. 27, 1961, 36-42167

Int. Cl.² B65D *33/24*

U.S. Cl. 150—3 **7 Claims**



1. A reclosable flexible container comprising,

a bag body having flexible walls formed of a plastic film having an opening therein,

releasably interlocking rib and groove elements integrally part of the walls on facing inner surfaces thereof formed of a resilient material and separable by drawing the elements apart and interlockable by pressing the elements together, external flanges on the upper exposed edges of said walls which may be gripped and drawn apart to separate said elements,

said rib element being arrowhead shaped with the rib and groove elements having interengaging upper surfaces extending toward the outside of the bag and interengaging lower surfaces extending toward the inside of the bag with the upper engaging surface of the rib element being shorter than the lower engaging surface of the rib element so that the bag opens relatively easily from the outside and resists opening from the inside,

said rib element surfaces being on the base of the arrowhead shaped rib element.

Re. 28,970

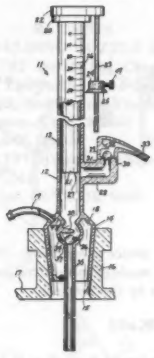
LIQUID DISPENSING DEVICE

Justin J. Shapiro, 1802 Second St., Berkeley, Calif. 94710

Original No. 3,211,335, dated Oct. 12, 1965, Ser. No. 333,068, Dec. 24, 1963. Application for reissue Feb. 25, 1975, Ser. No. 552,739

Int. Cl.² B67D *5/22*

U.S. Cl. 222—50 **2 Claims**



8. A burette device comprising a vertical cylindrical syringe chamber provided at its top end with an outwardly projecting stop flange, a vertically extending volumetric scale on said vertical syringe chamber having volume indications reading from smaller amounts to larger amounts in a downward direction, a dispensing plunger slidably and sealingly mounted in said chamber and having an enlarged horizontal top actuating portion, a depending vertical rod secured to said actuating portion and extending parallel to said chamber, a stop collar adjustably secured on said rod and being engageable with said stop flange to limit upward extension of said plunger, said stop collar serving as a mechanical stop for measuring the volume to be dispensed and, when the plunger is in its lowermost position, for accurately indicating on said scale the volume to be dispensed, a horizontal outlet conduit formed integrally with said chamber substantially at the level of the bottom of said plunger in its lowermost position, said plunger being normally in said lowermost position, a vertical upstanding check valve chamber integrally formed on the outer end of said outlet conduit and being provided with an outwardly and downwardly inclined discharge tip, said check valve chamber being provided with an upwardly facing ball valve seat, a movable valve ball on said seat, the

inner wall of the check valve chamber being integrally formed with an inwardly projecting stop lug overlying said ball and limiting upward movement thereof, means on the lower end of said syringe chamber to sealingly support the syringe chamber in the mouth of a liquid container, a check valve housing formed integrally with the lower end of said syringe chamber, a depending vertical intake tube formed integrally with and communicating with the bottom of said housing and defining a ball seat at its top end, a movable valve ball on said last-named seat, and an inwardly projecting stop lug integrally formed on the inside wall of said housing overlying said last-named valve ball and limiting upward movement thereof, wherein said sealing means comprises an outwardly projecting annular sealing rib integrally formed on the lower portion of the syringe chamber, respective annular resilient deformable sealing rings surrounding the syringe chamber above and below said rib, and an annular internally threaded cap member surrounding said sealing rings and having a top wall provided with a central aperture just large enough to pass said sealing rib.

Re. 28,971

LIGHT MODULATOR ELEMENT

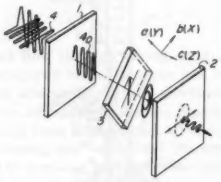
Akio Kumada; Keiichiro Aizu, and Yoshio Furuhata, all of Kodaira, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 3,586,415, dated June 22, 1971, Ser. No. 810,161, Mar. 25, 1969. Application for reissue Jan. 17, 1972, Ser. No. 218,567

Claims priority, application Japan, Mar. 30, 1968, 43-20815; Mar. 30, 1968, 43-20816

Int. Cl.[2] G02F *1/03*

U.S. Cl. 350—150 **12 Claims**



8. A birefringent device comprising:

a crystal element made of molybdate gadolinium oxide crystal structure given by the formula

$$R_2O_3 \cdot 3\,Mo_{1-e}W_eO_3$$

where e is a number of from 0 to 0.2, and R is an element selected from the group of Sm, Tb, Dy and Eu; and

means, connected to said crystal, for placing said crystal in one of the reversibly birefringent states thereof.

Re. 28,972

5-ARYL-1H-1,5-BENZODIAZEPINE-2,4-DIONES

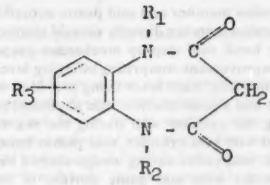
Karl-Heinz Weber, Gau-Algesheim; Herbert Merz; Karl Zeile, Ingelheim am Rhein; Rolf Giesemann, Bingen, and Peter Danneberg, Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhine, Germany

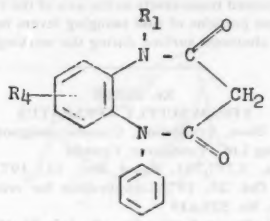
Original No. 3,660,381, dated May 2, 1972, Ser. No. 840,839, July 10, 1969. Application for reissue Dec. 4, 1975, Ser. No. 637,585

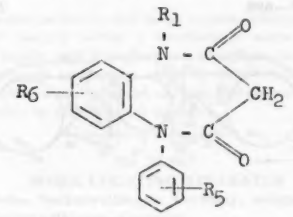
Int. Cl.[2] C07D *243/12*

U.S. Cl. 260—239.3 B **8 Claims**

1. A compound of a formula selected from the group consisting of







wherein

R_1 is alkyl of 1 to 4 carbon atoms, hydroxyethyl, hydroxypropyl, acetoxyethyl, cyclohexyl, benzyl or phenyl,

R_2 is naphthyl, pyrimidyl, thienyl, pyridyl, methyl-pyridyl or chloropyridyl,

R_3 is chlorine, bromine, trifluoromethyl or cyano,

R_4 is cyano , *or acetyl* or methoxycarbonyl ,

R_5 is cyano, nitro, acetyl or methoxycarbonyl, and

R_6 is halogen or trifluoromethyl.

Re. 28,973

3-(OMEGA-SUBSTITUTED ALKYL)-INDOLES

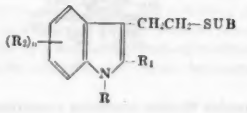
William J. Welstead, Jr., Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Original No. 3,642,803, dated Feb. 15, 1972, Ser. No. 556,879, June 13, 1966. Continuation-in-part of Ser. No. 504,087, Oct. 23, 1965. Application for reissue June 13, 1975, Ser. No. 586,699

Int. Cl.[2] C07D *401/06, 403/06*

U.S. Cl. 260—293.61 **24 Claims**

2. A compound selected from the group consisting of a free base and its pharmaceutically acceptable acid addition and quaternary ammonium salts, the free base having the structural formula:



wherein:

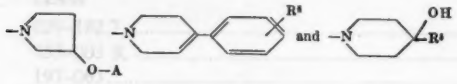
R is selected from the group consisting of hydrogen, lower-alkyl, lower-alkanoyl, benzoyl, benzyl, and cycloalkyl containing three to nine carbon atoms inclusive;

R_1 is selected from the group consisting of hydrogen, lower-alkyl, and phenyl;

R_2 is selected from the group consisting of hydrogen, halogen of atomic weight less than 80, trifluoromethyl, hydroxyl, lower-alkyl, lower-alkoxy, and benzyloxy;

n is an integer from zero to four inclusive;

SUB is a member selected from the group consisting of



wherein;

A is selected from the group consisting of hydrogen, 3,4,5-trimethoxybenzoyl, 3,4,5-trimethoxyphenylcarbamoyl, p-methoxycarbamyol, and 2-methoxyphenyl;

R^5 is a member selected from the group consisting of benzyl, phenyl and monosubstituted phenyl in which the substituent is selected from the group consisting of lower-alkyl, trifluoromethyl, and halogen of atomic weight less than 80, and

R^6 is selected from the group consisting of trifluoromethyl and halogen of atomic weight less than 80.

Re. 28,974

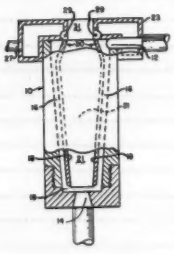
PROCESS FOR MAKING CARBON BLACK

Allan C. Morgan, Sudbury, and Merrill E. Jordan, Walpole, both of Mass., assignors to Cabot Corporation, Boston, Mass.

Original No. 3,619,140, dated Nov. 9, 1971, Ser. No. 606,665, Jan. 3, 1967. Application for reissue Nov. 2, 1973, Ser. No. 412,159

Int. Cl.² C09C *1/50*

U.S. Cl. 423—450 **7 Claims**



1. A process for making high-quality carbon black at unusually good yields and high volumetric production rates comprising

a. burning a hydrocarbon gas in oxygen in a compact combustion zone under high-intensity conditions so as to generate a stream of combustion gases having a temperature of over 3,000° F. and moving in essentially plug flow as it leaves the downstream end of said combustion zone at an exit velocity of at least about 2,000 feet per second,

b. injecting transversely into said exiting stream of hot combustion gases from the periphery thereof a plurality of individual *coherent* streams of hydrocarbon liquid make under sufficient pressure to cause same to enter said exiting stream at a linear velocity of more than about 100 feet per second, and

c. quenching the resultant reaction mixture after carbon formation has occurred.

4. A process for making high-quality carbon black at unusually good yields and high volumetric production rates comprising:

a. establishing a turbulent, high velocity stream of combustion gases in a compact combustion zone, said stream as it exits the downstream end of said combustion zone having a temperature of over 3,000° F. and moving in essentially plug flow at a rapid velocity capable of shearing individual streams of hydrocarbon liquid make injected thereinto as described in (b) below,

b. injecting transversely into said exiting stream of hot combustion gases from the periphery thereof a plurality of individual coherent streams of hydrocarbon liquid make under sufficient pressure to cause same to enter said exiting stream at a high linear velocity sufficient to assure rapid dispersal of said hydrocarbon liquid make at a position sufficiently remote from the hot walls of said injection zone to prevent smearing and coking of the injected reactant on said walls, and

c. quenching the resultant reaction mixture after carbon formation has occurred.

Re. 28,975

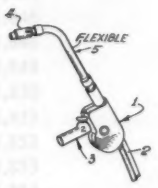
FLEXIBLE WELDING NOZZLE APPARATUS

Julius Rothman, 13702 Beach St., Cerritos, Calif. 90701; Edmond Andrew Tacconelli, 5456 Abbeyfield St., Long Beach, Calif. 90815, and Frank Vincent Buzzetta, 11399 Pinetree Lane, Stanton, Calif. 90680

Original No. 3,755,648, dated Aug. 28, 1973, Ser. No. 285,967, Sept. 5, 1972. Application for reissue Aug. 25, 1975, Ser. No. 607,712

Int. Cl.². B23K *9/00*

U.S. Cl. 219—130 **10 Claims**



1. Flexible apparatus for supplying electrical energy, welding gas and welding wire to the nozzle of a welding gun, said apparatus comprising:

an elongate member formed of electrically-conductive wire spirally wound in a circular path to provide a tube-shaped electrode capable of being bent longitudinally and of retaining its bent position,

a flexible support sleeve enveloping said electrode for resisting the tendency of said spiral winding to flatten during bending,

a flexible insulating sleeve protectively surrounding said support sleeve, said sleeves being disposed in a radially-spaced disposition providing a continuous longitudinal path for said welding gas,

welding wire guide means mounted in the bore of said tubular electrode, and

means for operatively coupling one end of the electrode to said gun and the other to said nozzle whereby welding current is supplied to the nozzle through said electrode windings and welding wire fed to the nozzle through said electrode bore.

PATENTS

GRANTED SEPTEMBER 21, 1976

ERRATA

For CLASS	See PATENT NO.
029–182.7	3,981,062
355–003 R	3,981,085
197–063	3,981,383
235–092 FQ	3,981,440
235–150.2	3,981,442
235–156	3,981,443
264–148	3,981,484
029–025.35	3,981,687
029–156 WL	3,981,688
029–195	3,981,691
062–049	3,981,701
062–087	3,981,702
062–509	3,981,703
429–123	3,981,742
429–218	3,981,743
429–178	3,981,744
204–266	3,981,745
429–013	3,981,746
429–015	3,981,747
429–164	3,981,748
250–493	3,981,805
214–017 D	3,981,824
526–227	3,981,846
526–263	3,981,848
526–082	3,981,849
526–227	3,981,850
526–267	3,981,851
526–250	3,981,852
526–255	3,981,853
528–481	3,981,854
526–063	3,981,855
526–004	3,981,856
536–004	3,981,860
536–017	3,981,861
536–007	3,981,862
536–025	3,981,863
260–878 R	3,981,957
260–878 R	3,981,958
427–043	3,981,985
426–001	3,982,003
426–641	3,982,004
426–002	3,982,008
426–003	3,982,009
235–088 N	3,982,104
339–144 R	3,982,185

PATENTS

GRANTED SEPTEMBER 21, 1976

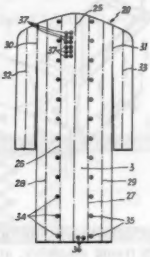
NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

3,981,026
WATERPROOF GARMENT OF REDUCED CUMBERSOMENESS

Leo Reverberi, 5, Passage de la Main d'Or, 75011 Paris, France

Filed Jan. 9, 1975, Ser. No. 539,844
Claims priority, application France, Aug. 30, 1974, 74.29601
Int. Cl.² A41D *15/00*
U.S. Cl. 2—1 **5 Claims**

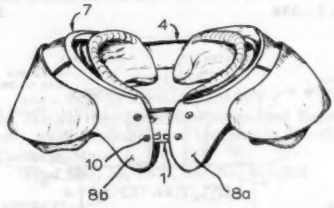


1. A waterproof garment for protection against rain made from thin, flexible waterproof material, having a longitudinal axis of symmetry and adapted to be folded into folds to assume the appearance of a band, wherein the folds are permanent and preformed parallel to one another, symmetrically with relation to a central fold which substantially coincides with said axis of symmetry, complementary closure means for the folded garment being located symmetrically along each of the two folds closest to the central fold, said means being spaced a distance from the central fold that is less than the spacing separating said central fold from each of the closest folds.

3,981,027
FOOTBALL SHOULDER PAD RESTRICTER

George C. Anderson, 2883 Doidge Ave., Pinole, Calif. 94564

Filed June 19, 1975, Ser. No. 588,213
Int. Cl.² A41D *13/00*
U.S. Cl. 2—2 **9 Claims**



1. In football shoulder pads having epaulets, shoulder caps, body arches over each shoulder extending from front to back forming a pair of breast plates and a pair of back plates, means for hinging the various segments, body strap means for adjusting said shoulder pads, and a protective underlayer of padding,

the improvement comprising a front restricter insert positioned between said breast plates having a substantially rectangular shape, a pair of elongated horizontal slots equipositioned adjacent the lower edge of said front restricter insert, a pair of angled slots relative to said slots adjacent the lower edge each positioned adjacent the upper corners of said insert, and a

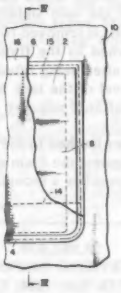
back restricter insert positioned between said back plates having a substantially rectangular shape and relatively longer than said front restricter, a pair of holes adjacent along the lower edge, a pair of angled slots each positioned adjacent the upper corner areas of said insert

each insert slidably mounted to said breast plates and back plates with mounting means, said mounting means cooperating with and communicating with said slots and said holes of said front restricter insert and said back restricter insert.

3,981,028
POCKET DEVICE

Joseph Siegel, Port Washington, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 9, 1975, Ser. No. 584,702
Int. Cl.² A41D *27/20*
U.S. Cl. 2—254 **3 Claims**



1. A pocket device for an item, said pocket device comprising

an outer pocket of the item having a closed bottom and an open top;

an inner pocket affixed in the outer pocket in inverted position, said inner pocket having an open bottom spaced from and in close proximity with the bottom of the outer pocket and a closed top in the area of the top of the outer pocket whereby an article is passable alongside the inner pocket in the outer pocket and into the inner pocket via the open bottom of said inner pocket and is inaccessible to casual removal from the outer pocket.

3,981,029
DUAL LEVEL TOILET FLUSHER

Allen M. L. Johnson, Succasunna, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Sept. 24, 1975, Ser. No. 616,279
Int. Cl.² E03D *1/34, 5/02;* **A61B** *19/00*
U.S. Cl. 4—67 A **2 Claims**

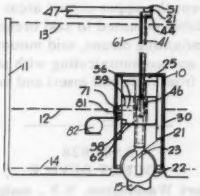
1. Apparatus for selectively flushing the tank of a toilet so as to cause one of two different quantities of volume of water to flush when the apparatus is operated, comprising

a float which is mountable over the drain outlet of a toilet tank so as to seal the tank when the float lies against the drain opening, said float fitted at its top to a hollow sleeve, the other end of which sleeve is joined by a tension member to a first operating lever,

a ballast member formed with an axial opening of a size to freely slide over said sleeve,

said ballast member slidably mounted in a frame that may be fixed to the structure of the toilet tank,

a rod, one end of which is fixed to a knob slidably located in the interior of the sleeve, the other end of the rod being fastened by a tension member to a second operating lever,



means to selectively individually rotate either one of the operating levers so as to apply tension force and lift either the hollow sleeve or the slidable knob, depending on the lever which is so rotated,

means to latch the ballast to the frame, said means linked to the motion of the said slidable knob such that the weight of the ballast is removed from the float valve when the ballast is latched to the frame causing the float to remain unseated after being lifted off the drain opening until the water level of the tank has dropped below to a first level which affords negative buoyancy to said float valve,

said ballast, when not latched to the frame serving to cause the float to seat against the drain opening when the water level of the tank reaches a second level higher than said first level.

3,981,030

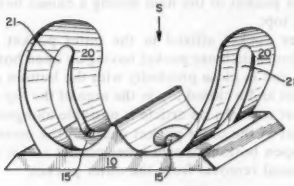
SUNBATHING ACCESSORY

Jeanette A. Turner, P.O. Box 7204, Greensboro, N.C. 27407

Filed May 27, 1975, Ser. No. 581,108

Int. Cl.² A47C *21/00*

U.S. Cl. 5—327 R **4 Claims**



1. A foot support for sunbathers comprising:

a. a base member having an upper surface and a pair of foot retaining end walls extending upwardly from spaced points along the upper surface;

b. said base member further including a pair of spaced depressions therein between said end walls for receiving the heels of a sunbather when in the reclined position;

c. said end walls including a foot engaging portion adjacent the upper end and having a vertical dimension of such magnitude that, when occupied, the foot engaging portion engages only the outer edge of the sunbather's foot at a point more than half-way up from the heel toward the toes;

d. said end walls being spaced apart a distance substantially equal to the combined width of the feet of a normally sized sunbather.

3,981,031

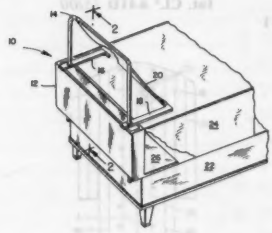
INCLINED BEDREST

Louis L. Schacht, 278-3B Crosse Drive, Cranbury, N.J. 08512

Filed Aug. 27, 1975, Ser. No. 608,031

Int. Cl.² A47C *21/00*

U.S. Cl. 5—327 B **10 Claims**



1. A portable bed attachment for providing anatomical support comprising a frame assembly, attachment means for mounting the frame assembly along a marginal edge of a bed, swing arms rotatably mounted to the frame assembly, locking means integral with the frame assembly and cooperatively interacting with the swing arms for releasably securing the frame assembly in an extended mode projecting vertically above the bed, said locking means being activated by the horizontal deployment of the swing arms, a slant sheet fastened along one edge to the frame assembly, sheet engagement means on said swing arm for grippingly receiving an opposite edge of the sheet when in said deployed position, whereby the sheet defines an inclined pillow supporting surface, said opposite edge of the sheet further being selectively releasable from engagement with the swing arms to remove the pillow support.

3,981,032

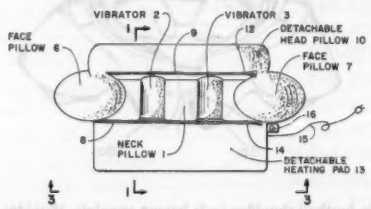
NECK PILLOW DEVICE

Susie C. Brooks, Denver, Colo., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 23, 1976, Ser. No. 651,928

Int. Cl.² A61H *1/00*; A47G *9/00*

U.S. Cl. 5—338 **3 Claims**



1. A neck pillow device for supporting the neck of a reclining person, said neck pillow device comprising

a neck pillow;

a pair of vibrators for vibrating the neck of a person resting on the neck pillow, said vibrators being mounted on the neck pillow in mutually spaced relation each on a corresponding side of the neck of the person; and

a pair of face pillows mounted on the neck pillow for supporting the face of a person lying on his side on the neck pillow, each of the face pillows being positioned alongside a corresponding one of the vibrators with said vibrators interposed between said face pillows.

3,981,033

MATTRESS

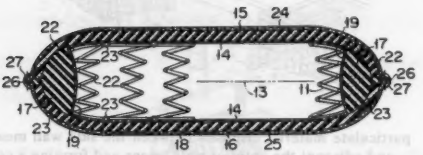
Kooichiro Toda, Hachioji, Japan, assignor to France Bed Co. Ltd., Tokyo, Japan

Filed Oct. 10, 1975, Ser. No. 621,464

Claims priority, application Japan, Oct. 12, 1974, 49-122922[U]; Oct. 12, 1974, 49-122923[U]; Apr. 25, 1975, 50-56483

Int. Cl.² A47C 27/00

U.S. Cl. 5—351 5 Claims



1. A mattress comprising a flat-constructed spring assembly, a pair of elastic material sheets which are attached respectively to upper and lower faces of said spring assembly and whose peripheral edge portions are so extended as to form a space at a side peripheral portion of said spring assembly and are opposed to each other at their respective tip ends, and a side-elastic material member formed, by subjecting a foamable plastic to foaming-in-place, in said space through a barrier sheet so stretched as to prevent said foamable plastic from entering said spring assembly, and a covering means for covering an elastic body consisting of said spring assembly, said elastic material sheets and said side-elastic material member, wherein the respective peripheral edge portions of said elastic material sheets are particularly longitudinally intensified by impregnating said foamable plastic into the whole portions of said respective peripheral edge portions which contact said side-elastic material member.

3,981,034

BOX SPRING ASSEMBLY

Robert D. MacMorran; Lloyd E. Tieman, and Raymond L. McQuitty, all of Carthage, Mo., assignors to Flex-O-Lators, Inc., Carthage, Mo.

Filed Mar. 24, 1975, Ser. No. 561,072

Int. Cl.² A47C 27/22

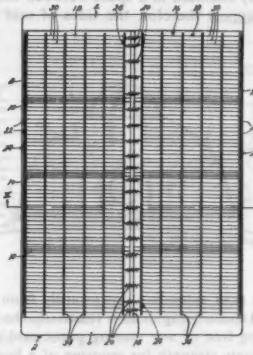
U.S. Cl. 5—354 9 Claims

1. A box spring assembly for a two-person bed comprising:

a. a rigid, open, generally rectangular frame including generally parallel side rails and a rigid center rail generally parallel with and midway between said side rails,

b. a composite sheet of flat, flexible material overlying said frame, and

c. means securing said sheet to said side rails, said sheet being supported intermediate said side rails on said center rail, said sheet including resilient means at both sides of said center rail and operable to permit elastic extension of said sheet in its own plane in a direction transversely of said frame, whereby downward deflection of said sheet at one side of said center rail will not cause downward



deflection of said sheet at the opposite side of said center rail.

3,981,035

COLLAPSIBLE HIGH SPEED BOAT

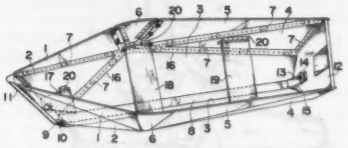
Arata Iwabuchi, Tokyo, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed May 20, 1975, Ser. No. 579,144

Claims priority, application Japan, May 21, 1974, 49-57060

Int. Cl.² B63B 7/04

U.S. Cl. 9—2 C 6 Claims



1. A collapsible high speed boat including a hull structure comprising a plurality of substantially triangular plates formed by joining in line plural inflection points on the hull, said hull structure including back and front gunwale lines and curved fan-shaped plates at gunwale portions adjacent to central portions of the hull, each of said curved fan-shaped plates joining the back and front gunwale lines in streamline relation, and a rigid keel extending from a stem portion of the hull to a stern portion of the hull in order to prevent the hull structure from being bent in the longitudinal direction thereof.

3,981,036

LIFE SAVING BUOY FOR SMALL VESSELS

William York Higgs, Gibsons, Canada, assignor to Intercontinental Marine Limited, Canada

Filed Apr. 22, 1975, Ser. No. 570,364

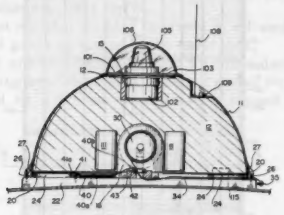
Claims priority, application United Kingdom, Apr. 22, 1974, 17516/74

Int. Cl.² B03B 21/52

U.S. Cl. 9—9 14 Claims

7. A life-saving buoy having a base, said buoy suitable for being carried by a vessel in a manner permitting release of the buoy should the vessel sink, and having sufficient buoyancy to cause the buoy and parts carried by the buoy to float off the vessel when the vessel sinks, and including an anchoring cable initially carried by the buoy having its free outer end attachable to the vessel and its inner end connected to the buoy, whereby upon sinking of the vessel the buoy is released from the vessel and remains on the surface of the water while the

vessel sinks with the cable being paid out from the buoy so that the cable maintains connection between the buoy and the vessel, wherein there is provided a life-boat mooring line normally totally enclosed in a space between the base of the buoy and a support therefor, the sides of said space being



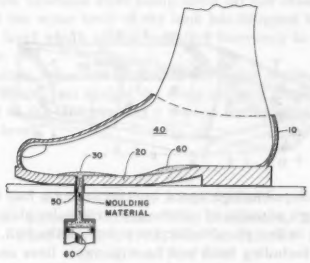
enclosed by a skirt extending downwardly from the sides of said buoy, said space being shallow relative to the height of the buoy and being free of any moving parts, said mooring line being of adequate strength for mooring of a boat or life-raft thereto.

3,981,037

PROCESS FOR INSTALLING AN ARCH SUPPORT IN A CONVENTIONAL SHOE

George A. McCroskey, Sr., Florence, Ala., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Aug. 11, 1975, Ser. No. 603,643
Int. Cl.² A43D *00/00*; A43B *13/38*, *13/42*
U.S. Cl. 12—146 S **2 Claims**



1. A process for installing arch supports in conventional shoes, comprising:

drilling a hole in the sole of the shoe at a point in the shoe which is directly beneath the metatarsal arch of the user's foot, when the foot has been placed into the shoe;

placing the user's foot into the shoe; injecting a settable and curable plastic material through the hole into the shoe directly against the user's foot to completely fill at least the area between the sole and the wser's arch to cause an arch support to be molded therebetween;

allowing said support to set; and removing the user's foot after the support has set.

3,981,038

BRIDGE AND ABUTMENT THEREFOR

Henri C. Vidal, Tour Aurore - Cedex No. 5, 92080 Paris, France

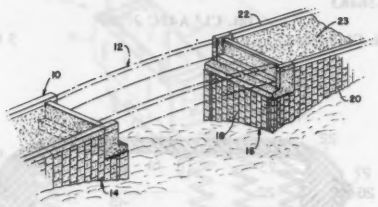
Filed June 26, 1975, Ser. No. 590,729
Int. Cl.² E02D *5/20*
U.S. Cl. 14—26 **16 Claims**

1. In a bridge having deck means spanning a distance between spaced-apart abutment means, an improved abutment means providing vertical support to an end of the deck means, comprising:

anterior wall means having an exterior surface, a top edge, generally vertical spaced-apart side edges, and being assembled from a plurality of facing elements;

a pair of side wall means, each side wall means disposed adjacent a corresponding side edge of the anterior wall means, having an exterior surface, and being assembled from a plurality of facing elements;

a plurality of elongate reinforcing members, at least one of said members being attached to each facing element, said members extending away from the exterior surface associated with the corresponding facing element, the elongate reinforcing members being arranged to define a plurality of generally horizontal layers that are spaced apart vertically from each other;



particulate material disposed between the side wall means and adjacent the anterior wall means and forming a contiguous aggregate filling the spaces between said layers and between laterally spaced members in said layers, the contiguous aggregate extending vertically above the top edge of the anterior wall means and having an upper surface; and

beam seat means for supporting an end of the deck means, said beam seat means being superimposed on the upper surface of the contiguous aggregate and spaced from said wall means,

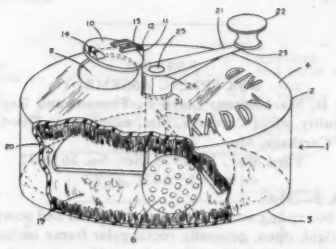
whereby the wall means support only their own weight and the particulate material bears the weight of the end of the deck means.

3,981,039

PORTABLE GOLF BALL WASHING DEVICE

Joel D. Rumph, El Dorado Hills, Calif., assignor to D-J Enterprises, Inc., El Paso, Tex.

Filed July 18, 1975, Ser. No. 597,155
Int. Cl.² A63B *47/04*
U.S. Cl. 15—21 A **4 Claims**



1. A washing device for a small, spherical object comprising a cylindrical container having a closed top and bottom with a sealable top opening scrubbing means disposed on the interior surface of the top and bottom of the cylinder and externally rotatable means disposed within said container for moving said spherical object in a circular direction between said scrubbing means; said rotatable means comprising a spiraling

inclined plane with an axis of rotation generally coincident with the perpendicular axis of the cylinder and adapted to move said spherical object between said scrubbing pads when turned in one direction and to displace said spherical object in an upward direction through said top opening when turned in the other direction.

3,981,040

WET MOP CONSTRUCTION HAVING PILE FABRIC MOPPING ELEMENT

John Walter Crofton, La Grange, Ga., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Nov. 14, 1974, Ser. No. 523,885

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² A47L *13/20*

U.S. Cl. 15—229 A **5 Claims**

1. A wet mop construction comprising a mop head having a flexible pile fabric main body of generally trapezoidal shape with opposite parallel sides of unequal length and opposite non-parallel sides extending in flared relation therebetween, said main body pile fabric comprising a relatively dimensionally stable base sheet having water-absorbent pile yarns attached to said sheet and being disposed to extend outwardly from opposite faces of the trapezoidal shaped main body, and a headband extending along and attached to the shorter parallel side of said pile fabric main body; and support means grippingly engaging only the headband of said mop head while leaving the pile fabric main body thereof free from supporting contact by support means to thereby position said main body in flexible, free-hanging, flaring relation from said support means.

3,981,041

SPONGE IRRIGATION SYSTEM FOR AUTOMATIC ANALYSIS APPARATUS

John G. Atwood, Redding, and Lucian C. Ducret, Riverside, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 22, 1974, Ser. No. 499,856

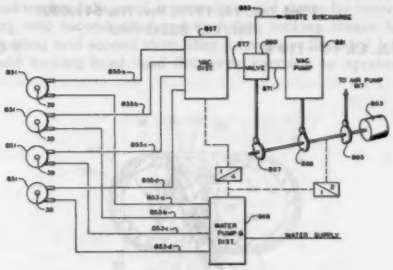
Int. Cl.² A47L *7/00*

U.S. Cl. 15—302 **4 Claims**

1. Sponge irrigation apparatus for irrigating a plurality of wiping sponges used in analysis apparatus comprising:

a. means at least partially enclosing each sponge to be irrigated said means having an inlet and an outlet;

b. means to sequentially supply an irrigation fluid to each of said enclosing means;



c. means to sequentially draw contaminated irrigation fluid from said enclosing means.

3,981,042

PILE CARPET CASTOR

Vernon J. Carrier, 25830 Viana St., Lomita, Calif. 90717

Filed Nov. 20, 1975, Ser. No. 633,684

Int. Cl.² B60B *33/00*

U.S. Cl. 16—47 **4 Claims**

1. A castor for use with pile carpet, said castor including an elongated axle, a support means for supporting said axle, and means for contacting a carpet rotatably mounted on said axle in which the improvement comprises:

said means for contacting a carpet comprising a plurality of separate wheels, a sleeve and holding means for securing said wheels on said sleeve,

each of said wheels having parallel sides, a centrally located hole, a generally cylindrical periphery located symmetrically about said hole in each wheel, and a plurality of bosses located on its periphery so as to extend therefrom,

said bosses on each of said wheels being equally spaced from one another, being of a non-pointed configuration and being shaped so that the ends of said bosses remote from the peripheries of said wheels are smaller than the portions of the bosses at the peripheries of said wheels,

said wheels being located in side-by-side relationship to one another with said holes in alignment with one another,

said sleeve fitting around said axle so as to be rotatably mounted on said axle and fitting closely against the interior of each of said holes, said wheels fitting with respect to said sleeve so as to be capable of rotation relative to and about said sleeve,

said holding means frictionally securing said wheels with the adjacent sides of said wheels abutting against one another so that normally said wheels will rotate together as a unit and so that said wheels are capable of rotating independently of one another.

3,981,043

SLIDABLE TOOL GRIP

Christian O. Curry, 8 Block Island Drive, Sound Beach, N.Y. 11789

Filed Jan. 14, 1975, Ser. No. 541,000
Int. Cl.² B25G 1/00
U.S. Cl. 16—110 R 9 Claims

1. In combination with a tool, a gripping arrangement for use with said tool having a handle which is normally gripped by both hands of the user, said combination comprising:

a tool;

a handle connected to said tool;

gripping means formed for slidable disposition on the handle of the tool and for movement therealong between positions proximate tool end of said handle and the free end of the said handle opposite the tool end thereof;

said gripping means being of a size and configuration to accommodate one hand of the user of the tool;

at least one stop means detachably attached near the free end of the handle at a position therein, leaving room between itself and the free end of the handle to permit grasping of the handle proximate the free end by the other hand of the user; and

end means carried by said gripping means at the extremities thereof to protect the hand of the user from striking said stop means and the tool disposed at the tool end of the handle, said end means including means relatively incompressible in a direction perpendicular to the length of the handle but relatively compressible in a direction parallel to the length of the handle so as to absorb end shocks developed by said gripping means approaching the extremities of its travel.

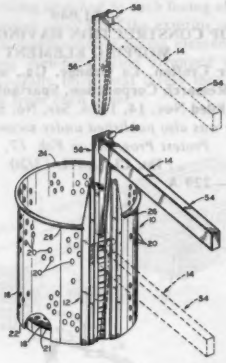
3,981,044

RECEPTACLE HANDLE ASSEMBLY

Clem J. Luebke, Beloit, Wis.; Norman L. Beck, Rockton, and Lowell W. Daniels, Rockford, both of Ill., assignors to The Broaster Co., Rockton, Ill.

Filed May 27, 1975, Ser. No. 580,595
Int. Cl.² A47J 45/06
U.S. Cl. 16—114 A 19 Claims

1. A handle assembly for a receptacle having a side wall comprising, a bracket mountable on said wall and having top and bottom ends with respect to said wall, a handle until selectively positionable with respect to said bracket at a plurality of locations in the direction between said top and bottom ends, said handle unit and said bracket including means cooperably interengaged to support said handle unit for sliding movement relative to said bracket in said direction, and said handle unit and said bracket further including actuable latch and keeper means releaseably interconnecting said handle unit against sliding movement when said handle unit is in each of said locations, said latch and keeper means including means interengaging to restrain actuation thereof.

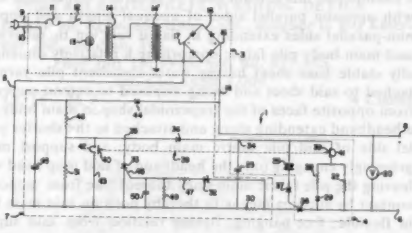


3,981,045

STUNNING AND OVERLOAD CIRCUIT

John Collins, Kansas City, Mo., assignor to Jerry L. McWhirter, St. Joseph, Mo.

Filed Mar. 19, 1975, Ser. No. 559,899
Int. Cl.² A22B 3/08
U.S. Cl. 17—1 E 15 Claims



12. A stunning and overload protection circuit for an animal stunning apparatus having spaced first and second electrodes engageable by an animal and comprising:

a. power supply means for providing pulsating direct current to a first and a second electrode of an animal stunning apparatus;

b. timing circuit means electrically connected to said power supply means for activating and deactivating one electrode of an animal stunning apparatus; and

c. circuit overload protection means electrically connected to said power supply means and to said timing circuit means whereby said one electrode is prevented from activating in the event of a circuit damaging quantity of said current being conducted through said one electrode of said stunning apparatus.

3,981,046
PROCESS FOR PRODUCTION OF SHIRRED MOISTURIZED FOOD CASINGS

Herman Chiu, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

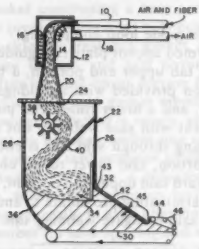
Filed May 5, 1972, Ser. No. 250,583
Int. Cl.² A22C *13/00*
U.S. Cl. 17—49 18 Claims

1. A process for producing shirred cellulosic casing having a predetermined uniform moisture content which comprises
a. providing a supply of cellulosic casing stock to be moisturized;
b. advancing said cellulosic casing about a hollow mandrel to and through a shirring apparatus;
c. applying to the interior surface of casing stock advancing over the hollow mandrel and prior to advancing through the shirring zone of a shirring apparatus a uniform predetermined rate and quantity of an aqueous solution containing at least about 25% humectant; and
d. shirring said moisturized casing stock thereafter.

3,981,047
APPARATUS FOR FORMING A BATT FROM STAPLE FIBERS

Rashmikant M. Contractor, Wilmington, and Sang-Hak Hwang, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 13, 1975, Ser. No. 577,056
Int. Cl.² D01G *25/00*
U.S. Cl. 19—155 8 Claims



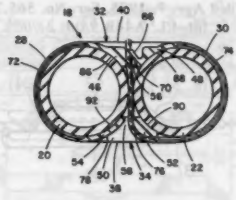
1. In an apparatus for separating staple fibers from a fiber-laden transporting air stream and depositing them on a moving conveyor belt to form a batt, a stationary chute comprising front, back and side plates forming an upright rectangular body, an entrance opening at the top for receiving fibers, an opening at the bottom closed by the conveyor belt, an exit opening in the front plate for a batt of fibers to be carried out of the chute on the conveyor belt, a weir plate positioned on the front plate with the bottom edge of the weir plate forming the top of the exit opening, a row of inwardly-directed air jets along the bottom edge of the weir plate for maintaining a constant fiber level at the exit opening, and perforations in the back plate for escape of air.

3,981,048
SMOOTH EXTERIOR DUAL CLAMP

Roy A. Moody, Flossmoor, and Ronald T. Fulton, Tinley Park, both of Ill., assignors to Pandult Corporation, Tinley Park, Ill.

Filed Dec. 29, 1975, Ser. No. 644,694
Int. Cl.² B65D *63/00*
U.S. Cl. 24—16 PB 18 Claims

1. A clamp for holding a pair of elongate objects such as hoses in spaced, generally parallel relationship, said clamp comprising:
a first elongate flexible strap for engaging one of said objects;
a second flexible strap for engaging the other of said objects; and
a locking head disposed intermediate said straps for receiving said second strap and including locking means for holding said second strap after it has been threaded into said locking head, said first strap carrying an aperture

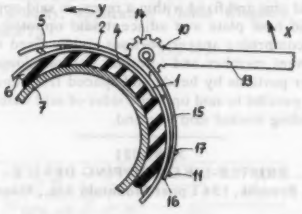


frame adjacent its free end whereby after said first strap has been positioned to partially encompass one of the objects, said second strap can be positioned to partially encircle the other object and the free end of the second strap threaded into said frame, between the longitudinal axes of said objects, and into said locking head thereby to hold said objects in spaced, generally parallel relationship.

3,981,049
CLAMPING DEVICE WITH TIGHTENING DEVICE

Hans Oetiker, 21, Oberdorfstrasse, Horgen, Switzerland

Continuation of Ser. No. 349,697, April 10, 1973, abandoned.
This application Apr. 1, 1975, Ser. No. 564,132
Claims priority, application Switzerland, Apr. 11, 1972, 5273/72; Aug. 9, 1972, 11744/72
Int. Cl.² B65D *63/02*; B25B *27/10*, *15/00*
U.S. Cl. 24—20 TT 41 Claims



1. A clamp for clamping a hose onto a nipple by means of a band means adapted to be closed, which is provided at its upper end with perforation apertures and at its lower end with at least one barb which engages in one of the perforation apertures when the band is placed about the hose, and in which the band is provided with further perforation apertures of similar type at its lower end on the side of the barb nearer the end thereof and is additionally provided with a slot at its upper end, at least one section of the perforation apertures disposed adjacent the lower end being located within the area of the section of the slot adjacent the upper end of the band after placing the band about the hose, characterized in that the upper end of the band is provided with at least one barb means having a tip pointing in a circumferential direction opposite the tip of the barb of the lower end of the band for eventual engagement with one of two mutually movable coupling elements of a tightening means whose other coupling element is adapted to engage in a further perforation aperture of the lower end of the band, whereby said tightening device is firmly anchored by each of said at least one barb means at the upper end of the band during assembly and disassembly of

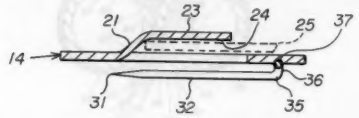
said band, and characterized in that the extreme end portion of the lower end of the band is curved radially outwardly with respect to a hose to be clamped for preventing cutting of the hose by said extreme end portion during tightening of the band.

3,981,050

SHOULDER STRAP RETAINER

Henry F. Dauphinais, P.O. Box 235, Rte. 202, Bantam, Conn. 06750

Filed Apr. 7, 1975, Ser. No. 565,779
Int. Cl.² A44B *9/00, 21/00*
U.S. Cl. 24—76 **3 Claims**



1. A retainer for holding a strap on a person's shoulder and comprising:

a base plate;

a strip member comprising a spacer portion fixed to one side of said base plate adjacent to one end thereof and extending away from said one side, and a terminal portion spaced from and substantially parallel to said one side and extending toward an opposite end of said base plate so as to form a chamber with three open sides that accommodate entry and exit of the strap, said strip member comprising an original portion of said base plate severed therefrom except for an edge joining said base plate and said spacer portion and having a bend at said edge and a bend joining said spacer and terminal portions; and

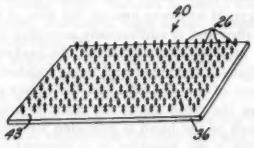
securing means fixed to a side of said base plate opposite said one side, said securing means comprising solely of a pair of spaced apart substantially parallel pins with free pointed ends for penetrating clothing worn on the person's shoulder, and an attachment member joining ends of said pins and fixed within a recess in said opposite side of said base plate and adjacent said opposite end, said pins comprising spacer portions rigidly fixed to said attachment member and terminal portions joined to said spacer portions by bends and spaced from and substantially parallel to said opposite sides of said base plate and extending toward said one end.

3,981,051

BRISTLE-LIKE GRIPPING DEVICE

George C. Brumlik, 154 Upper Mountain Ave., Montclair, N.J. 07042

Continuation of Ser. No. 184,172, Sept. 27, 1971, abandoned which is a continuation of Ser. No. 19,800, Mar. 16, 1970, abandoned.
This application Apr. 26, 1973, Ser. No. 354,814
Int. Cl. A44b *17/00*
U.S. Cl. 24—204 **18 Claims**



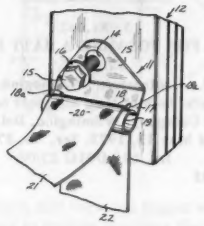
1. Self-gripping device comprising a multiplicity of thin, gripping elements having a bristle-like body uniform in cross section attached in close proximity to each other to a base, each of said gripping elements having self-gripping barbs spaced along the length thereof, said notched barbs being nicked in the body of the bristle-like gripping elements, said barbs being defined by adjoining indentations in and protrusions from said bristle-like body, and being disposed at an acute angle relative to the longitudinal axis of said gripping elements and above the longitudinal surface thereof, said gripping elements extending substantially perpendicularly from said base with at least some of said self-gripping barbs pointing towards said base and being adapted to penetrate and become lodged in a receiving layer for self-gripping engagement therewith.

3,981,052

LOW FRICTION GUIDE LOOP

Regis Victor Pilarski, Utica, Mich., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed July 23, 1975, Ser. No. 598,208
Int. Cl.² A44B *11/12;* **B60R** *21/10*
U.S. Cl. 24—163 R **5 Claims**



1. A low friction guide loop comprising:

an integrally formed anchor plate ring guide member having a flat anchor tab upper end portion, a transversely bent central portion provided with an elongate webbing slot therethrough, and a lower rolled end portion in spaced-apart alignment with said webbing slot so that seat belt webbing passing through said slot is entrained over said rolled end portion, said lower rolled end portion rolled upwardly toward said upper end portion, said lower rolled end portion terminating proximate to and in spaced-apart register with said elongate webbing slot.

3,981,053

TWO-PART WORM DRIVE CLAMP WITH VARIABLE LENGTH BAND-FORMING PART

Laurence G. Kreuzer, Des Plaines, Ill., assignor to DuPage Manufacturing Company, Downers Grove, Ill.

Filed Oct. 8, 1975, Ser. No. 620,698
Int. Cl.² B65D *63/02*
U.S. Cl. 24—274 R **6 Claims**

1. A two-part worm drive clamp comprising a tensioning part consisting of a comparatively short flexible strip having one end thereof terminating in a coupling tab which is of circular configuration and has an inclined narrow neck portion at its inner region, and a tensioning worm rotatably mounted on the other end of said strip, and a flexible band-forming part in the form of ribbon-like strip stock having leading and trailing ends, said band-forming part being provided adjacent to its trailing end with a tab-receiving opening which is designed for interlocking with said tab, is of keyhole configuration, and includes a relatively narrow rectangular trailing portion and a relatively wide circular leading portion the diameter of which is slightly in excess of the diameter of the tab in order that said tab may be passed sidewise through

said circular leading portion of the tab-receiving opening, the width of the trailing portion of the opening being such as closely to confine said inclined narrow neck portion when the band-forming part is tensioned about an article, said band-forming part being provided with a longitudinal series of spaced apart transverse slots extending inwardly from its leading end, and said leading end of the band-forming part being designed for cooperation with said worm whereby rotation of the worm will effect engagement thereof with said transverse slots to tension the clamp about the article.

3,981,054

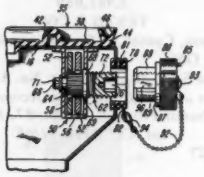
BURIAL CASKET WITH IMPROVED SEALING SYSTEM

George Scott Hull, Richmond; Louie V. Chaney, Centerville, and Richard Dean Watson, Richmond, all of Ind., assignors to Johnson Sheet Metal Works Corporation, Richmond, Ind.

Filed July 18, 1975, Ser. No. 597,099

Int. Cl.² A61G *17/00*

U.S. Cl. 27—17 **16 Claims**



1. A burial casket comprising a base section supporting a cover section for pivotal movement between an open position and a closed position, a resilient gasket member disposed between said base section and said cover section, a latch mechanism for drawing said cover section firmly toward said base section to compress said gasket member therebetween, said latch mechanism including a rotary actuator positioned generally adjacent an opening within one of said casket sections, means for rotating said actuator to effect movement of said latch mechanism between a released position and a latched position, said rotary actuator including a coupling portion projecting generally in axial alignment with said opening, a closure member for said opening and including an annular surface adjacent a coupling portion projecting axially through said opening, means for releasably securing said coupling portion of said closure member to said coupling portion of said rotary actuator, a sealing ring positioned adjacent said opening and surrounding said coupling portion of said closure member, and said sealing ring forms a substantially fluid-tight seal between said annular surface of said closure member and said one section of said casket.

3,981,055

APPARATUS FOR FORMING A YARN PACKAGE

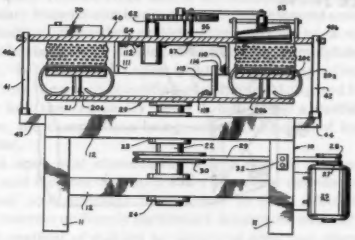
James H. Eakes, 12 Granger Drive, Cartersville, Ga. 30120; James G. Henderson, and James M. Henderson, both of 441 N. Hamilton St., Dalton, Ga. 30720

Filed June 17, 1974, Ser. No. 480,025

Int. Cl.² B65H *54/82*

U.S. Cl. 28—21 **8 Claims**

5. Apparatus for forming a package of yarn comprising, in combination: frame support means, a turntable rotatably supported on said frame support means, means for rotating said turntable, a pressure plate non-rotatably supported on said frame support means for pressure engagement with said turntable and for axial displacement away from said turntable to provide a yarn package forming area therebetween, means for introducing a length of yarn into the area between said turntable and said pressure plate whereby the friction of said turntable causes the yarn to be pulled into the area between the turntable and the pressure plate and move with said turntable, means for reciprocating the yarn in a rectilinear path oriented approximately radially with respect to the center of said turntable during each rotation of said turntable and means for selectively varying the frequency of the reciprocation of the yarn with respect to the speed of the turntable whereby the reciprocating radial displacement of the yarn



being draw into the area between the turntable and the pressure plate and simultaneous rotation of said turntable with respect to the pressure plate produces a number of sinuous shaped wave patterns in each revolution of said turntable and angular displacement about the turntable of the successive sinuous wave patterns to produce an overlapping relationship between adjacent revolutions.

3,981,056

DRIVE MECHANISMS FOR LATHE SPINDLES

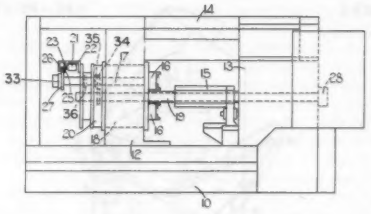
Harold James Gilbert, and Edmund Alexander McConnell, both of Coventry, England, assignors to Wickman Machine Tool Sales Limited, Coventry, England

Filed June 27, 1974, Ser. No. 483,778

Claims priority, application United Kingdom, June 27, 1973, 30663/73

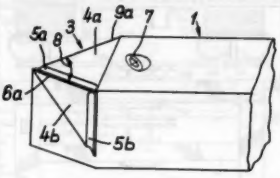
Int. Cl.² B23B *9/10*

U.S. Cl. 29—38 B **1 Claim**



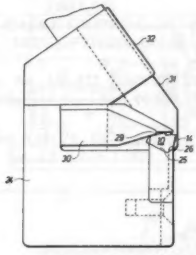
1. In a multi-spindle lathe a drive mechanism including means for producing angular movement of a work spindle of the multi-spindle lathe comprising an electrical stepping motor connected to the spindle, disconnectible drive means optionally connecting the stepping motor with the spindle, and a brake for said spindle, the improvement in which a plurality of stepping motors are mounted on a drum, means for indexing said drum, said drum having a plurality of work spindles rotatably mounted in the drum, the respective stepping motors being drivingly engagable through said disconnectable drive means with the respective spindles.

3,981,057
CUTTING TOOL
Kurt Koppers, Gummersbach, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed Nov. 14, 1975, Ser. No. 632,173
Claims priority, application Germany, Nov. 23, 1974, 2455612
Int. Cl.² B26D 1/12, 1/00
U.S. Cl. 29—96 7 Claims



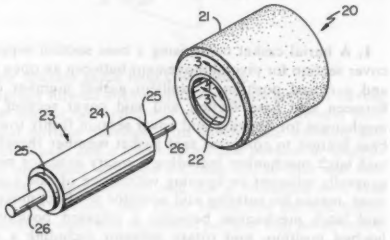
1. A cutting tool comprising
a. a tool bit having the configuration of a hollow pyramid including an open base and three side walls; each side wall having an outer face; the adjoining outer faces defining three cutting edges converging in the apex of the pyramid;
b. a base block including means defining a recess for receiving said tool bit; and
c. a clamping device for tightening said tool bit, positioned in said recess, to said base block.

3,981,058
CUTTING INSERT AND CUTTING TOOL
Axel Sven Olof Roos; Kurt Heinrich Albert Erich Faber, and Sven Axel Olof Wirfelt, all of Sandviken, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden
Filed Feb. 4, 1975, Ser. No. 546,911
Claims priority, application Sweden, Feb. 8, 1974, 74016791
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² B26D 1/00
U.S. Cl. 29—96 9 Claims



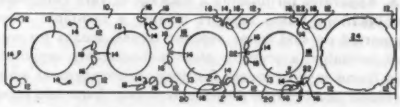
1. A tool holder and cutting insert combination consisting of a tool holder (24) and a cutting insert (10), said insert having a main cutting edge (12) and a secondary cutting edge (13) with a curved cutting tip portion (11) therebetween, the insert having around its circumference several edge surfaces extending parallel to the main cutting edge two of which edge surfaces, (15) and (16), being angularly interrelated and constituting bottom supporting surfaces, said surfaces forming an angle of 90° – 130°, preferably 100° – 120°, with each other, a third said edge surface constituting a clearance face for the main cutting edge, the insert having two opposite end surfaces, (18) and (19), one of which constituting the clearance face of the secondary cutting edge and the other constituting an end abutment surface, the top surface (20) being located opposite said angularly related edge surfaces (15, 16) and being provided with a bevel surface (23), said holder having an insert site at one of its ends, said insert site having bottom supporting surfaces (25, 26), angularly related at an angle of 90° – 130°, preferably 100° – 120°, and a side support, provided on an axially displaceable means in the holder, engaged by said angularly relates edge surfaces and said end abutment surface respectively of said cutting insert positioned therein, a movable clamping plate (29) being arranged for the clamping of the insert in said site, a movable arm (30) being secured to said clamping plate, said clamping plate being positioned over said insert and engageable with the bevel surface (23) thereof for pressing the insert against said bottom surfaces (25, 26) upon actuation of said arm by said axially displaceable means in the holder.

3,981,059
TEXTILE COT
Walter L. Dodson, Canton, N.C., assignor to Dayco Corporation, Dayton, Ohio
Filed Sept. 30, 1974, Ser. No. 510,855
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.² B21B 31/08
U.S. Cl. 29—127 15 Claims



1. A textile cot comprising an elastomeric outer portion and a rigid core bonded to and supporting said outer portion, said core comprised of a continuous interlocking tube capable of being expanded radially a sufficient amount to provide a press fit against an associated cylindrical supporting structure, said tube formed of elongated helically wound strip means having mechanically interlocking projections.

3,981,060
METHOD OF MAKING A THRUST WASHER
Richard Lassen Alling, Winchester, and Richard John Woiten, Torrington, both of Conn., assignors to The Torrington Company, Torrington, Conn.
Division of Ser. No. 506,239, Sept. 16, 1974, Pat. No. 3,937,541. This application Sept. 4, 1975, Ser. No. 610,323
Int. Cl.² B21D 53/12; B21K 1/05; F16C 33/64
U.S. Cl. 29—148.4 C 2 Claims



1. A method of forming a thrust washer from sheet metal comprising: forming a plurality of circumferentially spaced pairs of cutouts in the sheet metal with the circumferential

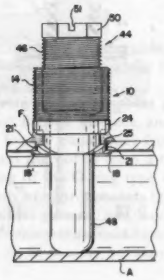
spaces separating the pairs of cutouts substantially greater than the circumferential space separating the cutouts in a pair from one another; forming a member having a substantially circular outside perimeter with the outside perimeter having the cutouts; forming a projection between the cutouts of each pair of cutouts; and bending over an outside portion adjacent said outside perimeter of the member to form an axially extending cylindrical flange which contains said projections and spaced pairs of cutouts.

3,981,061

METHOD FOR JOINING PIPES

William M. Jackson, Allentown, and Edwin E. Peters, Schnecksville, both of Pa., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Sept. 26, 1974, Ser. No. 509,460
Int. Cl.² F16L 41/00
U.S. Cl. 29—157 T 1 Claim



1. A method of attaching a coupling device comprising a lug pipe having a stem portion undercut about the entire periphery thereof, between a lug end and a coupling section so that the stem portion comprises a smaller diameter portion of said lug pipe, a pair of integral lugs extending respectively, from diametrically opposed points on the circumference of said lug end, locking means engageable with said lug pipe so that progressive engagement of said locking means with said lug pipe draws said lug toward said locking means into a compressive bearing relationship therewith, to interconnect a branch pipe in fluid flow communication with a main pipe in which a suitable circular hole has been formed, including the steps of

inserting one lug of said lug pipe into said hole, rocking said lug pipe in the direction to insert the second lug into said hole,

engaging a locator tool having a probe end with said lug pipe, progressively advancing said locator tool with respect to said lug pipe until said probe end contacts the interior surface of said main pipe opposite said hole and said lugs are in bearing contact with the interior surface of said main pipe adjacent said hole,

engaging said locking means with said lug pipe and advancing said locking means into bearing contact relationship with said pipe whereby said lugs are maintained in bearing relationship with the interior surface of said main pipe,

disengaging said locator tool from said lug pipe, and

connecting said branch pipe to the coupling section of said lug pipe.

3,981,062

APEX SEAL COMPOSITION FOR ROTARY ENGINES

David Moskowitz, Southfield, and James C. Uy, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 1, 1973, Ser. No. 402,526
Int. Cl.² C22C 1/05
U.S. Cl. 29—182.7 13 Claims

1. A seal element providing a dynamic seal between an eccentrically rotated rotor and a surrounding rotor housing for a rotary internal combustion engine, said element comprising a body of cemented carbide characterized by a weight analysis having 5–60% unalloyed nickel, 0–15% molybdenum carbide, 1–15% of an unprecipitated lubricating agent selected from the group consisting of graphite, MoS_2, and boron nitride, and the remainder being substantially a carbide of titanium, the composition being substantially free of iron or cementite.

2. An apex seal element for rotary internal combustion engine, said element constituted of a cemented carbide having additional and sufficient free carbon to form precipitated carbon rosettes uniformly distributed throughout said carbide.

12. A method of making an improved apex seal shape for use in a rotary internal combustion engine, comprising:

a. preparing an admixture of titanium carbide powder particles with a mesh size of −300, nickel and molybdenum carbide powder having a mesh size of −180, graphite powder with a mesh size of −200, regulating said admixture to have an analysis of 10–60% nickel, 0–15% Mo_2C, 1–15% graphite, and the remainder TiC,

b. milling said admixture for at least one and half hours,

c. pressing said admixture into an apex seal shape having a green strength density of at least 90% of fully dense,

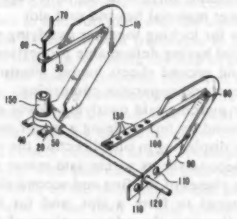
d. subjecting said shape to a temperature to form a liquid phase of said nickel and molybdenum carbide powders while permitting less than 1% of said graphite powder to be dissolved in said admixture and to provide sufficient liquid phase sintering to form a strong cemented carbide having an intimate and uniform distribution of graphite rosettes, carbide particles, and nickel binder, and being substantially free of porosity.

3,981,063

REDUCTION WRENCH HOLDER

Gordon R. Christensen, Calgary, Canada, assignor to The Raymond Lee Organization, Inc., a part interest

Filed Sept. 15, 1975, Ser. No. 613,108
Int. Cl.² B23Q 1/00
U.S. Cl. 29—283 5 Claims



1. A reduction wrench holder for use on the cutting edges of heavy earth moving machines and the like, comprising:

a V-shaped clamp with opposed first and second ends, the first end being designed to accommodate the head of a conventional reduction wrench;

a threaded rod mounted in the second end of the clamp to approach the first end when rotated clockwise as viewed from the top; and

a V-shaped bracket with first and second ends, the first end bearing a row of holes for accommodating the horizontal

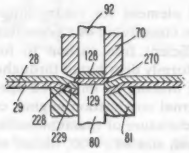
handle of a conventional reduction wrench and the second end having a row of holes for accommodating a downwardly and rearwardly extending bolt.

3,981,064

METHOD AND APPARATUS FOR INTERLOCKING OVERLAPPING SHEET MATERIAL

Otto P. Hafner, 1321 Paddock Way, Cherry Hill, N.J. 08034

Continuation-in-part of Ser. No. 560,786, March 21, 1975, Pat. No. 3,934,327, which is a continuation-in-part of Ser. No. 497,884, Aug. 16, 1974, Pat. No. 3,885,299, which is a division of Ser. No. 384,494, Aug. 1, 1973, Pat. No. 3,862,485.
This application Oct. 16, 1975, Ser. No. 623,036
Int. Cl.² B23P 11/00
U.S. Cl. 29—432 4 Claims



1. A method of locking together overlying sheets of metal or other material having deformable properties and including at least first and second sheets having interior and opposed exterior surfaces; said method comprising:

a. piercing said overlying sheets discontinuously along a boundary line defining a minor area;

b. displacing in one direction the material of said first and second sheets within said minor area out of the respective planes of the first and second sheet major-area sheet material to form a slot and bending in the opposite direction the edge portions of the major-area sheet material adjacent said slot, the extent of said displacement of said minor-area material being such that a substantial portion of the minor-area material of the first sheet is beyond the exterior surface of the bent edge portion of the second sheet material and a minor portion of the minor-area material of the second sheet is within said slot;

c. compressing together the displaced minor-area material of said first and second sheets while confining the displaced minor-area material of the second sheet to limit its outward spread and to spread outwardly said substantial portion of displaced minor-area material of the first sheet over the exterior surface of the bent edge portion of the second sheet material beyond said slot.

3. Apparatus for locking together overlying sheets of metal or other material having deformable properties and including at least first and second sheets having interior and opposed exterior surfaces; and apparatus comprising:

a. means for piercing said overlying sheets discontinuously along a boundary line defining a minor area;

b. means for displacing in one direction the material of said first and second sheets within said minor area out of the respective planes of the first and second sheet major-area sheet material to form a slot, and for bending in the opposite direction the edge portions of the major-area sheet material adjacent said slot, the extent of said displacement of said minor-area material being such that a substantial portion of the minor-area material of the first sheet is beyond the exterior surface of the bent edge portion of the second sheet material and a minor portion of the minor area material of the first sheet is within said slot;

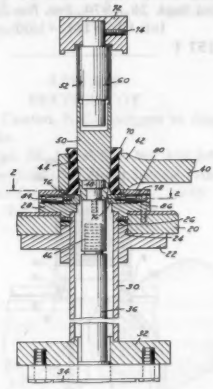
c. means for compressing together the displaced minor-area material of said first and second sheets while confining the displaced minor-area material of the second sheet to limit its outward spread and to spread outwardly said substantial portion of displaced minor-area material of the first sheet over the exterior surface of the bent edge portion of the second sheet material beyond the edges of said slot.

3,981,065

METHOD AND APPARATUS FOR ASSEMBLY OF BEARING BUSHING

Donald R. Gaines, Farmington; Jon M. Smallegan, Ann Arbor, and William H. Trudeau, Brighton, all of Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Sept. 10, 1975, Ser. No. 612,016
Int. Cl.² B23P 11/02
U.S. Cl. 29—450 5 Claims



1. A method for assembling a hollow compressible bushing between two radially spaced, inner and outer bearing elements which comprises:

a. supporting the outer bearing element against axial displacement,

b. introducing the hollow bushing into the outer bearing,

c. supporting one end of the bushing circumferentially against axial displacement in one direction,

d. inserting an inner bearing member within a bearing shuttle,

e. moving said shuttle through the outer bearing member while expanding the bushing to a diameter larger than said inner bearing member,

f. arresting the motion of the inner bearing member at a final axial orientation while still within said shuttle, and

g. moving said shuttle further through said inner bearing member to withdraw it from the bushing to complete the assembly.

2. An apparatus for assembling a hollow compressible bushing between two radially-spaced, inner and outer bearing elements which comprises:

a. an axial support for an outer bearing element,

b. a circumferential support for a compressible bushing positioned axially adjacent said support and having portions movable radially,

c. a shuttle movable axially through said outer bearing element and said support having a recess to receive an inner bearing element,

d. means to move said shuttle forceably through a bushing in said outer bearing element shaped to expand the bushing to an inner diameter greater than the outer diameter of said inner bearing element, and

e. means to limit the axial motion of an inner bearing element through said outer bearing element to position said

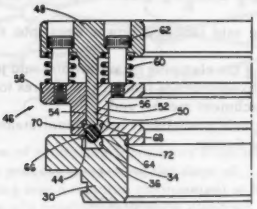
inner member in a proper axial orientation relative to said outer bearing element.

3,981,066

METHOD AND APPARATUS FOR INSERTING SEAL RINGS INTO RESTRICTED GROOVES

Martin A. Calvert, Oakland, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Nov. 11, 1974, Ser. No. 522,335
Int. Cl.² B23P 11/02
U.S. Cl. 29—451 2 Claims



1. The method of inserting and retaining a seal ring of the O-ring type in a circular groove in a seat ring for a high pressure valve, comprising the steps of:

providing a seat ring with an annular groove having side walls faced apart a fixed distance and retaining lips extending inward toward each other from said sidewalls at the outer portions thereof to form a restricted opening;

selecting a seal ring of the O-ring type of a relatively hard material, normally of approximately the same mean diameter as said annular groove, and having a cross-section radially thereof wider than said restricted opening but narrow enough to fit loosely between said groove sidewalls;

placing a funneled annular chute having a delivery opening approximately as wide as said restricted opening over and in alignment with said restricted opening; and

squeezing said seal ring around the circumference thereof across said cross-section and parallel to said restricted opening by pushing it axially through said annular chute and past said retaining lips.

3,981,067

METHOD OF SPLICING AND PRODUCTS THEREOF

Philip R. Oiler, La Crescenta, Calif., assignor to Hehr International Inc., Los Angeles, Calif.

Filed Feb. 18, 1975, Ser. No. 550,735
Int. Cl.² F16B 7/00; E04C 2/38
U.S. Cl. 29—522 4 Claims

1. A method of fabricating a frame adapted for receiving a closure means and adapted for installation in an aperture of a wall, comprising the steps of:

a. fabricating an elongated metal member having an exterior surface of elongated channel configuration at each end thereof,

1. said fabricating step defining the channel at each end of said elongated member by the formation of a pair of spaced flanges which are integral with and upstanding from said exterior surface and which extend in parallel relation to one another in the direction of elongation of said metal member to provide the sides of said channel, the portion of said exterior surface between said flanges being formed to define a flat configuration which comprises the floor of said channel, and

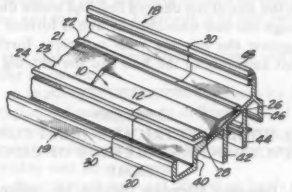
2. said fabricating step including the step of shaping the junctions between said flanges and said flat floor of said channel to define a pair of elongated grooves which extend along the opposite edges of said channel floor in facing relation to one another,

b. bending said elongated member into a closed-loop configuration and to position the opposite ends of said member in abutment with one another thereby to form a circumambiently shaped frame which has a single butt joint therein extending across said frame in a direction transverse to the direction of elongation of said member,

1. said bending step including the step of aligning the channels at the opposite ends of said member as well as their respective pairs of flanges and their respective flat floors and their respective elongated grooves to form a single, common-sided, flat-bottomed straight channel which extends across said butt joint,

c. further fabricating an elongated rectangular metal plate having a width substantially equal to the width of the bottom of said common channel and having opposing elongated edges which are spaced from one another by a distance slightly less than the distance between the sides of said common channel,

1. said further fabricating step including the step of shaping said elongated plate into a dihedral configuration wherein a pair of elongated rectangular planar plate sections are provided which are angularly inclined relative to one another about an elongated common



bend axis located between and extending substantially parallel to the opposing elongated edges of said plate,

d. inserting said plate into said common channel in overlapping relation to said butt joint with the common bend axis of said plate being oriented transverse to said butt joint,

1. said inserting step including the step of positioning said plate so that its said common bend axis extends across said butt joint with substantially half the length of said plate being located on each side of said butt joint and so that the opposing elongated edges of said plate are disposed closely adjacent to and in comparatively loose engagement with said elongated grooves; and

e. applying a force to the bend axis of said plate in a direction transverse to the floor of said common channel to flatten the portion of said plate overlying said butt joint toward said butt joint and to flatten the adjacent portions of said plate into surface engagement with the flatbottomed floor of said channel thereby to force said opposing edges of said plate further apart and to wedge said plate edges into outwardly directed tight locking engagement with the aligned elongated grooves on opposite sides of said butt joint,

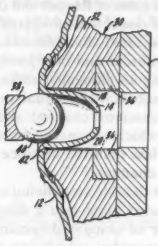
whereby said member ends are rigidly secured to one another through said plate to maintain the circumambient shape of said frame.

3,981,068

METHOD OF MAKING A SHEET METAL HUB ASSEMBLY

John Saxon Ivey, Bloomfield Hills, Mich., and Kenneth Albert Braybrook, Letchworth, England, assignors to Borg-Warner Corporation, Chicago, Ill.

Filed July 23, 1975, Ser. No. 598,441
Int. Cl.[2] B21D *39/00*; B23P *11/02*
U.S. Cl. 29—523 6 Claims



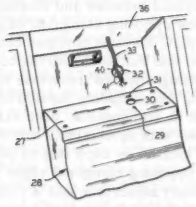
1. A method of assembling a cylindrical bearing to a drawn hub portion of a sheet metal annular part comprising the steps of (1) semidrawing the annular part to include a partly drawn hub portion, (2) placing the bearing in a die mechanism, (3) assembling the partly drawn annular part into said die mechanism with the hub portion partially engaged within said cylindrical bearing, (4) drawing and extruding the hub by moving an object the size of the desired finished inside diameter of the hub through the hub whereby the hub is formed to shape and forced against the bearing with sufficient force to make a permanent assembly of the hub and the bearing.

3,981,069

RANGE-HOOD ELECTRICAL WIRING CONNECTION ARRANGEMENT AND METHOD OF CONNECTING SAME

Robert J. Johansen, Glendale Heights, Ill., assignor to Aubrey Manufacturing, Incorporated, Union, Ill.

Filed Apr. 10, 1975, Ser. No. 566,738
Int. Cl.[2] B23P *19/00*; H05K *5/02*, *15/02*
U.S. Cl. 29—526 11 Claims



1. An electrical wiring arrangement for connecting suspendable fixture means to the power lines of the buildings in which they are suspended, said arrangement comprising;

preliminary attachment means which are preliminarily coupled to the jackets of the power lines for subsequent attachment to said suspendable fixture;

first aperture means through said preliminary attachment means for enabling the passage therethrough of said jacketed power lines;

clamping means located proximate to said first aperture means for mechanically securing said jacketed power lines to said preliminary attachment means,

connecting means substantially proximate to the periphery of said attachment means for connecting said preliminary attachment means to said suspendable fixture means, in a facilitated manner, whereby said jacketed power line is secured to said suspendable fixture means, and

second aperture means in said fixture means substantially aligned with said first aperture means in said preliminary attachment means to enable said jacketed wires to enter said fixture means for electrically connecting said fixture means wiring to said power lines.

9. A method for connecting suspendable fixture means to the power lines of the buildings in which they are suspended comprising the steps of:

a. securing a clamping means to preliminary attachment means,

b. inserting said jacketed power lines into said clamping means,

c. tightening the clamping means around said jacketed wires so as to fixedly secure said jacketed wires to said preliminary attachment means, and

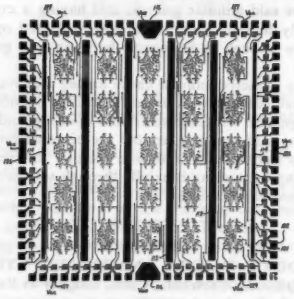
d. securing said preliminary attachment means to said suspendable fixture.

3,981,070

LSI CHIP CONSTRUCTION AND METHOD

Fred K. Buelow, Los Altos, and John J. Zasio, Sunnyvale, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 348,219, April 5, 1973, abandoned, which is a division of Ser. No. 270,449, July 10, 1972, Pat. No. 3,808,475. This application July 24, 1974, Ser. No. 491,237
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—574 20 Claims



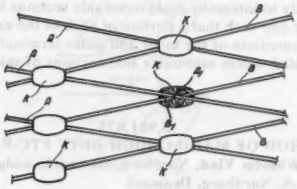
1. In a method for forming a plurality of LSI chips providing a plurality of semiconductor bodies having planar sufaces, forming diffused regions in said plurality of semiconductor bodies using the same set of common diffusion masks by subjecting said plurality of bodies to the same diffusion operations to provide a plurality of transistors and resistors in the semiconductor bodies, certain of said transistors in each of said bodies being formed so that they are substantially larger than other transistors in the same body with said substantially larger transistors being exclusively near the outer perimeter of the body and forming prior to testing of said resistors and transistors first and second layers of metallization on the surface of each of the semiconductor bodies with an insulating layer therebetween to form permanent connections to said transistors and resistors in said each semiconductor body by the use of preselected different fixed masks for said plurality of semiconductor bodies whereby the need for discretionary wiring is eliminated.

3,981,071

PROCESS OF THERMISTOR MANUFACTURE

Gianfranco Cirri, and Giovanni Fidanzati, both of Florence, Italy, assignors to Fabbrica Italiana Magneti Marelli, S.p.A., Milan, Italy

Filed Mar. 25, 1975, Ser. No. 561,940
Claims priority, application Italy, May 17, 1974, 22856/74
Int. Cl.² B01J 17/00
U.S. Cl. 29—573 4 Claims



1. A process of producing thermistors from semiconductor materials, the process comprising the steps of:

a. introducing into a reaction environment at least one pair of electrically conductive filiform elements, arranged to form therebetween at least one intersection, the elements being spaced a given distance apart at said intersection;

b. introducing into said reaction environment a compound of the semiconductor material, said compound being in the gaseous state, which semiconductor material is to comprise the desired thermistor, and other material required in the pyrolysis reaction of the compound;

c. individually heating each of the filiform elements so that the heat generated by each element is insufficient to induce a prylosis reaction while the heat generated by the elements in the region of the intersection is collectively sufficient to reach, only at each of the intersections, at least the minimum temperature required for a pyrolysis reaction, whereby a concentrated deposit of the semiconductor material is formed only at the intersection zones due to the pyrolysis reaction;

d. allowing the deposit of said material to grow until cores electrically and mechanically connecting the filiform elements at each intersection zones are formed;

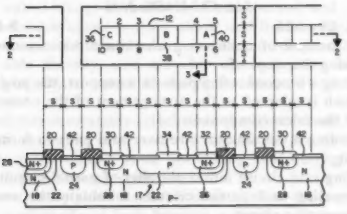
e. removing two adjacent branches of the filiform elements projecting from each of the cores and using the remaining two branches as connection terminals of the thermistor.

3,981,072

BIPOLAR TRANSISTOR CONSTRUCTION METHOD

James L. Buie, Panorama City, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 364,148, May 25, 1973, abandoned. This application Dec. 6, 1974, Ser. No. 530,113
Int. Cl.² B01J 17/00
U.S. Cl. 29—578 5 Claims



1. A method of fabricating an integrated circuit array of bipolar transistors utilizing a triple diffusion process, comprising:

a. forming on a semiconductor substrate surface of first conductivity type a permanent masking layer of substantial thickness defining a multiplicity of rectangular openings of width S and length 6S, where S equals about 0.1 mil, with each opening surrounded by a rectangular masking region of width S, and with adjacent masking regions separated from each other by a continuous unmasked region of width S, said rectangular opening being capable of division into six zones of equal area arranged in a row and identified as zones 1 through 6 taken consecutively;

b. applying a first masking layer of etchable material substantially thinner than said permanent masking layer over the surface of said substrate defined by said continuous region;

c. diffusing an impurity of second conductivity type into surface regions of said substrate defined by all six zones of said rectangular openings to form collector regions within said substrate;

d. applying a second masking layer of said etchable material over the surface of said substrate defined by all six zones of said rectangular openings;

e. etching said etchable material from said continuous region and from zones 3 through 6 of said rectangular openings;

f. diffusing an impurity of said first conductivity type into surface regions of said substrate defined by said continuous region and said zones 3 through 6 of said rectangular openings to form isolation regions surrounding all of the collector regions of said array and to form base regions within said collector regions;

g. applying a third masking layer of said etchable material over the surface of said substrate defined by said continuous region and said zones 3 through 6 of said rectangular openings;

h. etching said etchable material from zones 1 and 6 of said rectangular openings;

i. diffusing an impurity of said second conductivity type into surface regions of said substrate defined by said zones 1 and 6 of said rectangular openings to form collector contact regions within said collector regions and emitter regions within said base regions;

j. applying a fourth masking layer of said etchable material over the surface of said substrate defined by said zones 1 and 6 of said rectangular openings;

k. etching said etchable material from zones 1, 4, and 6 of said rectangular openings; and

l. depositing metal through said zones 1, 4, and 6 of said rectangular openings to form metallic contacts to said collector contact, base, and emitter regions, respectively.

3,981,073

LATERAL SEMICONDUCTIVE DEVICE AND METHOD OF MAKING SAME

Joseph H. Dully, Cupertino, Calif., assignor to Varian Associates, Palo Alto, Calif.

Division of Ser. No. 372,464, June 21, 1973, abandoned. This application July 26, 1974, Ser. No. 492,301
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² B01J 17/00
U.S. Cl. 29—580 9 Claims

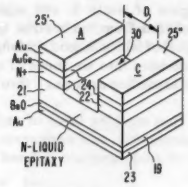
1. In a method for fabricating a lateral type semiconductive device the steps of:

on an N+ type semiconductive wafer of sufficient thickness to be self-supporting, growing a thin N− type epitaxial layer of semiconductive material having a substantially lower N− type carrier concentration than said wafer,

depositing a barrier layer of electrically insulative material on said epitaxial material,

removing a layer of the wafer material from the side opposite said barrier layer, leaving a substantially thinned wafer, the composite of said thinned wafer, said epitaxial

layer and said barrier layer being of sufficient thickness to be self-supporting depositing a layer of electrode material overlaying said wafer layer for making ohmic contact thereto; and



selectively removing areas of said layers of said electrode material and wafer material to define a pair of laterally spaced electrodes each making electrical connection to said epitaxially grown layer via an intervening layer of said wafer material.

3,981,074

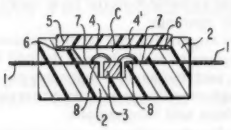
METHOD FOR PRODUCING PLASTIC BASE CAPS FOR SPLIT CAVITY TYPE PACKAGE SEMI-CONDUCTOR UNITS

Katsumi Yamamoto; Masahiro Fujimori; Masahiro Fujinawa, and Sanenobu Sonoda, all of Ibaragi, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaragi, Japan

Filed Aug. 23, 1974, Ser. No. 499,951

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—588 **6 Claims**



1. A method of producing a completed lead frame embedded plastic base cap for a sealed plastic split package semiconductor unit wherein said unit comprises:

split base cap and top cap sections with at least said base cap being provided with an electronic element receiving cavity facing said top cap,

an electronic element carried within said cavity,

external leads extending through the sidewalls of the base cap with their inner ends terminating within said cavity,

internal leads bonded to said element and to the ends of said external leads within said cavity,

said top cap overlying said cavity and being peripherally sealed to said base cap,

said method comprising the steps of:

providing a lower mold section with its upper face including a rectangular recess,

placing an initial rectangular base cap body whose length and width are less than that of said lower mold section recess and whose height is generally equal thereto within said recess and spaced from the sides thereof to form a lower mold section rectangular mold cavity surrounding said initial base cap body, said initial base cap being formed with a centrally located, hollow cavity on one side thereof and a peripheral land defining said cavity,

placing a lead frame on the initial base cap body in such a manner that the inner, terminal end portions of the individual leads rest on the peripheral land of said initial base cap body surrounding said central cavity of said initial base cap body, said lead frame extending at least over a portion of the upper face of said lower mold section

placing an upper mold section overlying said lower mold section, said upper mold section including a rectangular mold cavity within the lower face thereof corresponding to the rectangular mold cavity of said lower mold section, said upper mold section including a central portion sealingly engaging said initial base cap body and further including an outer portion surrounding said upper mold section rectangular mold cavity sealingly engaging said lower mold section, and

injecting molten material within said superposed molded cavity to integrally mold outer side sections to said initial base cap such that a portion of each of the external leads intermediate of the inner and outer terminal ends is embedded within said outer side sections of said base cap.

3,981,075

METHOD OF MAKING HIGH-DUTY PTC-RESISTOR

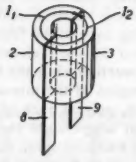
Holger Wilhelm Vind, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Division of Ser. No. 521,244, Nov. 6, 1974. This application Oct. 14, 1975, Ser. No. 621,745

Claims priority, application Germany, Nov. 14, 1973, 2356765

Int. Cl.[2] H01C *7/02, 7/04*

U.S. Cl. 29—612 **2 Claims**



1. A method of manufacturing a PTC resistor comprising the steps of forming a body by pressing it in one direction in a mold, dividing said body in halves along at least one plane which extends parallel to said direction to form end faces in said plane, sintering said halves, applying contact layers to said end faces, interposing contact pieces between said end faces and joining said halves.

3,981,076

METHOD OF CONNECTING ELECTRONIC MICROCOMPONENTS

Gerard Nicolas, Grenoble, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 27, 1974, Ser. No. 527,828

Int. Cl.[2] H05K *3/30*

U.S. Cl. 29—626 **8 Claims**

1. A method of connecting electronic microcomponents comprising the steps of:

securing wire connecting pads on a support, the position of which is adapted to the arrangement of the connections for the microcomponents;

unwinding a continuous wire over said pads to form a circuit;

dividing said circuit into a plurality of partial circuits;

superposing said partial circuits to obtain the complete connecting circuit;

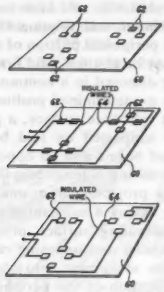
stripping the insulated wire at each pad;

securing the stripped wire portions to the corresponding pads;

cutting off those parts of the wire which do not form part of

the final connecting circuit;

positioning the microcomponents so that each microcomponent is in electrical contact with one of said pads; and



securing the microcomponents to their respective pads.

3,981,077

ELECTRICAL GARDEN SHEARS

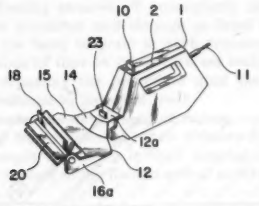
Keiji Manabe, Neyagawa, and Yoshio Ishii, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 27, 1975, Ser. No. 580,795

Claims priority, application Japan, May 31, 1974, 49-62362; July 18, 1974, 49-82785

Int. Cl.² B26B *19/38*

U.S. Cl. 30—233 10 Claims



1. Garden shears for cutting vegetation comprising:

a main body housing;

motor means within said housing for driving said shears;

cutting means attached to said housing and connected to said motor means for cutting vegetation in the path of said shears, said cutting means comprised of:

a fixed cutter portion attached to the bottom of said housing, said fixed cutter portion having a plurality of cutter blades at the forward end thereof, and

a movable cutter portion above said fixed cutter portion connected to said motor means and reciprocally movable thereby, said movable cutter portion having a plurality of cutter blades at the forward end thereof; and

guard means rotatably attached to the front of said housing and extending over said cutting means for preventing unwanted objects from contacting said cutting means, said guard means comprised of:

a stationary guard rotatably connected to the lower front portion of said body housing, extending forward therefrom and spaced above said cutting means, and

a rotary guard rotatably mounted to the front of said stationary guard spaced above and parallel to the front of said cutting means.

3,981,078

ELECTRIC KNIFE WITH GUIDE BLADE

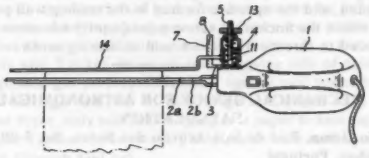
Rosette Caroline Alberti, 7 Rue Marie Bonaparte, Saint Cloud (Hauts de Seine), France

Filed Nov. 17, 1975, Ser. No. 632,717

Claims priority, application France, Dec. 3, 1974, 74.39452

Int. Cl.² B26B *29/02*

U.S. Cl. 30—293 2 Claims



1. An electric knife comprising two cutting blades that slide in contact with each other with alternate reciprocating movement, a handle, a guide blade parallel to and spaced from the cutting blades, means mounting said guide blade for swinging movement relative to the cutting blades about an axis perpendicular to the planes of the cutting blades, and means resiliently urging said guide blade to rotate about said axis downwardly relative to the cutting blades, said guide blade mounting and urging means comprising a cylindrical sleeve secured to said handle, a cylindrical cap slidable and rotatable on said sleeve, a coil compression and torsion spring within said cap and sleeve, one end of said coil compression spring being fixed relative to said handle, the other end of said coil compression spring being fixed relative to said cap, a screw-threaded rod coaxial within said cap and sleeve and spring and perpendicular to said cutting blades, a nut screw-threadedly disposed on said rod and bearing on the outer side of said cylindrical cap to slide said cap axially on said sleeve, said guide blade being secured to said cap, and an abutment on which said guide blade slides and against which said guide blade is urged by the torsion of said spring.

3,981,079

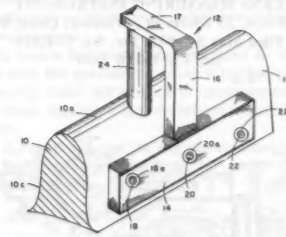
DENTAL IMPLANT AND METHOD OF MOUNTING THE SAME IN THE JAW BONE

Joseph J. Lenczycki, 89 Florence Road, Riverside, Conn. 06878

Filed Aug. 23, 1973, Ser. No. 390,770

Int. Cl.² A61C *13/00*

U.S. Cl. 32—10 A 17 Claims



1. Dental implant assembly for maintaining a dental prosthetic device in fixed relation with respect to a jaw bone, the implant assembly comprising a support post adapted to be introduced into a complementary cavity formed in the region of the crest of the jaw bone, said support post being provided with at least one transverse aperture formed therein at an end of said support post adapted to be disposed within said cavity; at least one anchoring screw adapted to extend through a hole

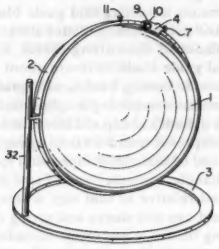
drilled in the jaw bone in a direction substantially normal to said support post to threadedly engage the jaw bone and said transverse aperture formed in said support post, whereby said anchoring screw anchors and stabilizes said support post in the jaw bone; said support post being formed as a hollow cylindrical sleeve; and said at least one transverse aperture being formed through diametrically opposed wall portions of said sleeve, the aperture formed in the leading wall portion through which the anchoring screw first advances being unthreaded, and the aperture formed in the trailing wall portion into which the anchoring screw subsequently advances being threaded to threadedly receive said anchoring screw.

3,981,080

MECHANICAL DEVICE FOR ASTRONOMICAL CALCULATION

Mario Gama, Rua de Jose Acursio das Neves, No. 5-20 Esq., Lisbon, Portugal

Filed Nov. 11, 1975, Ser. No. 630,915
Claims priority, application Portugal, Nov. 12, 1974, 62921
Int. Cl.[2] G01C *21/24*
U.S. Cl. 33—1 SC **7 Claims**



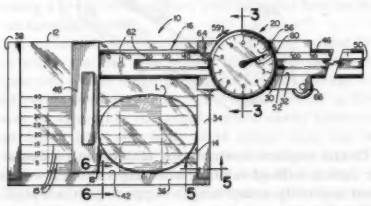
1. A mechanical device adapted for determining the position of an observer by star sight observations, said device comprising a hollow sphere having a number of sets of pairs of holes, the two holes in each set lying at diametrical extremities, a rigid ring, means on said ring for engaging said holes to rotatably mount said sphere in said ring such that a plane through said ring passes through a great circle on said sphere, slidable carriage means on said ring for travel in the plane thereof, and marking means on said ring along a graduated quadrant starting from zero degrees, on a horizontal axis to 90° at the top of the vertical axis of the said ring for determining the position of said carriage means thereon.

3,981,081

LENS MEASURING INSTRUMENT

Richard J. Welch, 33 Gloria St., Windsor, Conn. 06111

Filed May 5, 1975, Ser. No. 574,359
Int. Cl.[2] G01B *5/00*
U.S. Cl. 33—174 A **15 Claims**



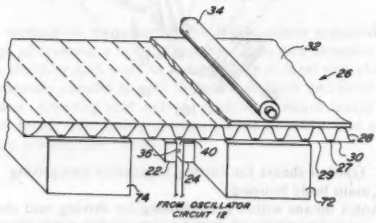
1. A lens measuring instrument comprising a transparent base having a substantially planar parallel upper and lower lens supporting surfaces, means defining a substantially planar first reference surface fixed relative to said base and projecting above said upper surface and against which an associated portion of the peripheral edge of a lens supported by said upper surface may be abutted, means defining a second reference surface fixed relative to said base and projecting below said lower surface in normal relation thereto and against which an associated peripheral portion of a lens supported by the lower surface may be abutted, said first and second reference surfaces being disposed in a common plane, means for orienting a lens in a predetermined position on said base and relative to said first reference surface, a generally L-shaped measuring member supported on said base for movement longitudinally thereof in one and an opposite direction, said measuring member having a longitudinally extending beam and a measuring jaw projecting from one end of said beam, said measuring jaw having a substantially planar and transversely disposed measuring surface projecting above said upper surface in parallel and opposing relation to said first reference surface for movement into abutting engagement with an associated portion of the peripheral edge of a lens supported by said upper surface, supporting means on said base engaging said beam and supporting said measuring member for movement in said one and said opposite longitudinal direction, and means associated with said beam for indicating the position of said measuring surface relative to said first reference surface.

3,981,082

APPARATUS AND METHOD FOR MONITORING THE MOISTURE GRADIENT IN A MOVING WEB

William A. Massey, Mount Holly, N.J., assignor to Molins Machine Company, Inc., Camden, N.J.

Filed May 30, 1975, Ser. No. 582,569
Int. Cl.[2] F26B *3/34*
U.S. Cl. 34—1 **15 Claims**



1. Apparatus for generating a control signal representative of the moisture gradient in a moving web of material containing various amounts of moisture, comprising:

means for generating a radio frequency signal;

means for transmitting said radio frequency signal as an electromagnetic field;

means for applying said radio fequency signal to said transmitting means; and

envelope detector means for generating a low frequency signal repesentative of the envelope of an amplitude modulated radio frequency signal appearing across the transmitting elements, the envelope of said amplitude modulated signal being representative of fluctuations in the strength of said electromagnetic field due to the absorption of energy by moisture in a web moved through said field.

3,981,083

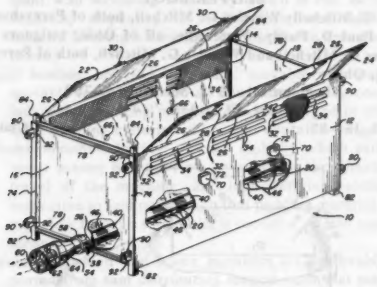
GRAIN STORAGE AND SHIPPING CONTAINERS

Jack Dewayne Danford, 1450 S. Havana - Suite 340, Aurora, Colo. 80012

Continuation-in-part of Ser. No. 488,264, July 15, 1974, Pat. No. 3,893,244. This application June 9, 1975, Ser. No. 585,023

Int. Cl.² F26B 7/00, 25/10

U.S. Cl. 34—19 6 Claims



6. A method of handling grain in loose bulk form from harvest in the field to delivery at a final destination, comprising:

providing a plurality of ventilatable containers;

providing closure means in at least one wall of the containers for filling and/or discharge of grain in loose bulk form;

loading the loose grain in the field directly into the containers and securing the closure means in position;

storing the grain in the containers for predetermined periods of time;

periodically forcing streams of atmospheric air to flow through the container and through at least the major portion of the body of grain in each container for extended periods of time to remove excess moisture from the grain, repeating the procedure until the moisture content is reduced to a desired level;

loading the containers onto transport means;

and delivering the containers to their ultimate destination, with the cargos remaining in their original containers from initial loading in the field to arrival at their ultimate destination.

3,981,084

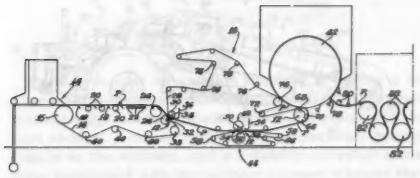
CLOSED DRAW TRANSFER SYSTEM WITH GASEOUS PRESSURE DIRECTION OF WEB

John T. Sobota, Green Bay, Wis., assignor to Fort Howard Paper Company, Green Bay, Wis.

Continuation-in-part of Ser. No. 263,798, June 19, 1972, abandoned. This application May 1, 1974, Ser. No. 465,895

Int. Cl.² D21F 5/02, 9/02

U.S. Cl. 34—123 4 Claims



1. A paper making apparatus for assuring movement of paper in the desired path of travel after passing through a nip in a closed draw transfer system, said apparatus comprising, in combination, a gas permeable top pick-up felt having paper carried thereon for processing, a Yankee dryer for assisting in defining said nip with said felt, said paper being located between said felt and said Yankee dryer at said nip, said nip having an outgoing side and an incoming side, means for moving said felt and thereby said paper to said nip for processing said paper at said nip, a roller associated with said felt for cooperating in defining said nip, a chamber defined with said roller, means for communicating the outer surface of said roller with the interior of said chamber, means for substantially continuously applying gaseous pressure from within said chamber through said communicating means in a direction towards said Yankee dryer on said outgoing side of said nip through said gas permeable felt and against said paper being passed through said nip so as to urge said paper onto said Yankee dryer, only said felt carrying said paper to said nip and only said Yankee dryer carrying said paper from said nip after passing through said nip.

3,981,085

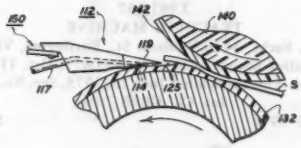
AIR STRIPPING DEVICE FOR ELASTOMERIC SURFACE

Eugene B. Franko, Marion, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 10, 1975, Ser. No. 548,477

Int. Cl.² G03G 15/20

U.S. Cl. 355—3 R 5 Claims



1. In an electrostatic reproduction machine in which copies are produced from document information and wherein the powder images are fixed to the copy sheets by passing the powder images on the sheets through a nip formed by an elastomeric fuser roll and a back up roll which apply heat and pressure thereby fusing the powder images onto the sheets, an improved stripping apparatus for stripping copy sheets from the surface of an elastomeric fuser roll comprising:

a stripper member positioned at a predetermined distance from an elastomeric fuser roll surface and from which copy sheets are to be stripped,

said stripper member having a tip portion having at least one aperture formed therein facing the elastomeric fuser roll surface at an acute angle relative to a tangent to the fuser roll surface,

air supply means for providing pressurized air in communication with the aperture to cause a rippled effect on the elastomeric fuser roll surface to cause separation of the copy sheet leading edge therefrom onto the stripper member,

wherein the tip portion of the stripper member is positioned at an angle ranging from about 10° to 30° relative to a tangent to the fuser roll surface.

3,981,086

CARREL APPARATUS FOR USE IN LEARNING

Irene Burns Hoeflinger, 7 Joy Drive, Manhasset Hills, N.Y. 11040, and Diana Cohen, 11 Knoll Lane, Glen Head, N.Y. 11545

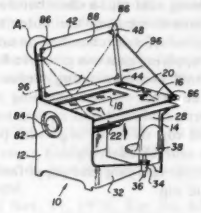
Filed Oct. 25, 1974, Ser. No. 517,939

Int. Cl.² A47B 41/00

U.S. Cl. 35—60 17 Claims

1. A learning carrel having various learning aids adapted for display on demonstration surfaces comprising a desk having

two learning areas one of which is movably connected with said desk for movement to and from an open learning position with the open position being substantially perpendicular to the other of said learning areas, means for attaching the various learning aids to the demonstration surfaces of said learning areas so that the various learning aids can be detachably



affixed to said learning areas, said desk having a top side defining said other of said learning areas, a rotatable drum disposed in the carrel comprising a plurality of compartments wherein the various learning aids are selectable from said drum and storable therein, and an access window defined in said desk top side to permit access therethrough to said plurality of compartments.

3,981,087

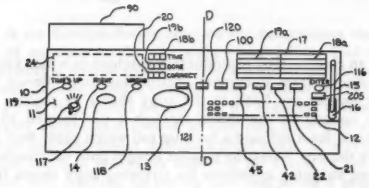
TEACHING MACHINE

Thomas D. Sachs, 34 S. Williams St., Burlington, Vt. 05401

Continuation-in-part of Ser. No. 405,671, Oct. 11, 1973, abandoned. This application June 23, 1975, Ser. No. 589,045

Int. Cl.² G09B *7/04*

U.S. Cl. 35—9 A **52 Claims**



1. A teaching machine including a housing, a display fixed on said housing, an operable means for the input of data;

a plurality of cards positioned within said housing each of which cards has data thereon, the data being a question or concept and information related to said question or concept;

mechanical means within said housing to sort said cards, including a first stacking means to position cards on the top of an active stack, a second stacking means to stack cards into a reserve stack, and a third stacking means to stack cards into a discard stack;

display position means to position said cards in a display position associated with said display;

operable means for the input of data by the student in response to stimuli generated by the machine;

picker means to remove cards from the bottom of the active stack or alternatively from the reserve stack;

a first conveyor means to transport said cards from either the reserve stack or alternatively the active stack to said display position means;

a second conveyor means to transport cards from said display position to either the first stacking means to be placed back in the active stack in the case of an incomplete or wrong answer or an answer which is as yet insufficiently learned or alternatively to the third stacking means to be placed in the discard stack in the case of a correct answer or an answer which has been adequately learned; and

recording means to record machine readable question or concept related data and/or student record data on the cards sufficient to indicate if the question or concept has been correctly or incorrectly answered or responded to and to indicate the state of the user or student's knowledge concerning the question or concept.

3,981,088

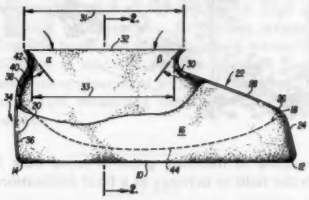
SLIPPER-BOOT

James G. Mitchell; Winalee G. Mitchell, both of Perrysburg, and Paul D. Purdy, Waterville, all of Ohio, assignors to James G. Mitchell and Winalee G. Mitchell, both of Perrysburg, Ohio

Filed Jan. 21, 1975, Ser. No. 542,750

Int. Cl.² A43B *7/14*

U.S. Cl. 36—87 **5 Claims**



1. A slipper-boot formed from a sheet of synthetic polymeric sheeting material, comprising an elongated seamless sole portion having forward and rear ends; generally upright side portions integral with said sole portion and extending upwardly therefrom, said side portions having forward edges, rear edges and top edges; said forward edges being joined by a toe seam extending generally upwardly and rearwardly from said seamless sole portion to a first location below said top edges and then turning to extend forwardly and upwardly to meet said top edges; said rear edges being joined by a heel seam extending generally upwardly and forwardly from said seamless sole portion to a second location below said top edges and then turning to extend rearwardly and upwardly to meet said top edges; said toe and heal seam each intersecting said upper edges at an angle when viewed from the side of the slipper and said toe and heel seams forming with said side portions and said top edges an upwardly flared foot-receiving throat with an upper opening having a first perimetral length along said top edges and with a lower opening having a second, smaller perimetral length below said top edges.

3,981,089

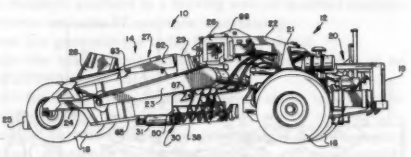
PADDING MACHINES

Norman Bruce Burrows, Rte. 2, Box 3109, Odessa, Tex. 79763

Filed Oct. 6, 1975, Ser. No. 619,948

Int. Cl.² E02F *5/22*

U.S. Cl. 37—142.5 **15 Claims**



1. A modified scraper machine for distributing padding material within a previously dug ditch, comprising:

a prime mover, a distributing section including a container for holding padding material, a conveyor means for trans-

ferring material from said container into a ditch; means, including said prime mover, for propelling said container along the surface of the ground, such that the conveyor means can follow a path of travel which is parallel to a previously dug ditch;

said container means having a bottom, opposed side walls, a movable rear wall, and a movable front wall; said side walls being affixed to and upwardly extending from said bottom, said movable rear wall including means by which it can be moved horizontally towards said front wall, said front wall including means by which it can be moved vertically respective to said bottom and side walls, thereby forming an outlet of controllable area therebetween;

said bottom, opposed side walls, movable rear wall, and movable front wall form an upwardly opening container into which padding material can be charged in order to store padding material within said container means;

frame members having opposed ends by which said conveyor means is supported normally to the direction of travel of the machine, and in underlying relationship respective to said outlet such that padding material which may flow through said outlet is received by said conveyor means;

means by which said frame members are removably supported from said distributing section such that said conveyor means is disposed adjacent to said outlet in a position to receive padding material which may flow therethrough, and such that said conveyor means can be detached for transporting purposes;

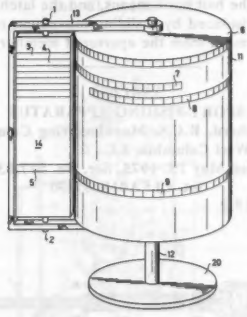
so that padding material can be charged into said container, said front wall can be raised to form an outlet, said rear wall can be moved towards said front wall to force the material through said outlet, where it is received by said conveyor and transported into a ditch.

3,981,090

APPARATUS FOR DISPLAYING CHANGEABLE ARRANGEMENTS OF INDICIA

Arthur Berge, Wennerbergsgatan 6, 112 58 Stockholm, Sweden

Filed May 23, 1974, Ser. No. 472,850
Int. Cl.² G09F *11/30*
U.S. Cl. 40—64 R **4 Claims**



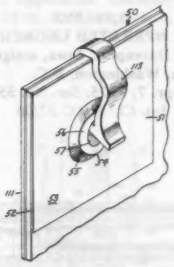
1. A device for information handling including a support element movable in an endless path and having column indicators thereon, vertically spaced horizontal grooves in the support element arranged to form rows, selectively positionable indicia in the grooves, and a rotatably mounted identifying plate juxtaposed with the support element wherein the plate has identifying rows on both sides of the plate aligned with the slots of the support element, a base on which said device is supported, a standard upstanding from said base, a vertical rod mounted for vertical sliding movement on and relative to said standard, said support element being secured to said rod, a frame in which said plate is rotatably mounted, said frame being movable vertically with said rod and being slidable vertically on said standard, whereby the program range of the information handling device can be doubled by rotating opposite sides of the plate into row registry with the support element and the weight of the plate and support element can be adjusted relative to said base.

3,981,091

PICTURE FRAME CONSTRUCTION

Samuel G. Wiener, Jr., 451 W. Broadway, New York, N.Y. 10012

Filed Oct. 7, 1974, Ser. No. 512,494
Int. Cl.² G09F *1/12*
U.S. Cl. 40—152.1 **2 Claims**



1. In a picture frame construction of a type including a transparent front panel element, a rear panel element, and clip means for interconnecting said front and rear panel elements in congruent relation to enclose a print or picture, the improvement comprising: said clip means including integrally molded synthetic resinous retaining elements, each having a channel forming member engaging the exposed surfaces of said front and rear panels at juxtaposed edges thereof, an elongated resilient portion interconnected to a portion of said channel-forming member, and a hooked member interconnected to said resilient member, said rear panel having a circular recess extending inwardly from an outer surface thereof for engaging said hooked member to thereby simultaneously position said retaining elements relative to said juxtaposed front and rear panels and place said resilient member thereof under tension; said orifices being incorporated in separate planar members adhesively affixed to said rear panel in desired locations.

3,981,092

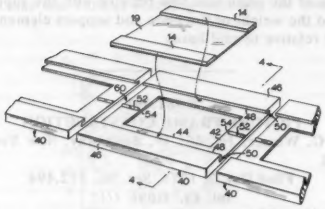
SLIDE FRAME

Roy Ramsdale, Willowdale, Canada, assignor to Alex L. Clark Limited, Toronto, Canada

Filed May 21, 1974, Ser. No. 471,849
Int. Cl.² G09F *1/10*
U.S. Cl. 40—158 R **2 Claims**

1. A frame for use in mounting a photographic film transparency, comprising a mat having a picture aperture, means on one face of the mat forming a pair of opposed slots one in each of two first opposed sides of the aperture, the slots being open at each end thereof, and stop means carried by said one face of the mat on the second opposed sides of the aperture

transverse to the slots, said stop means comprising a rib located on each of said second opposed sides of the aperture,



each of the ribs lying parallel to the slots centrally therebetween and terminating adjacent the aperture to define a ledge.

3,981,093

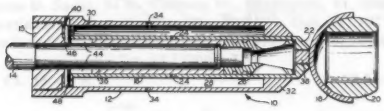
GAS OPERATED LAUNCHER

Frederick P. Reed, Davenport, Iowa, assignor to The United States of America, Washington, D.C.

Filed Apr. 7, 1975, Ser. No. 556,366

Int. Cl.[2] F41C *27/06*

U.S. Cl. 42—1 F **4 Claims**



1. A launching device for hurling a mass toward a target comprising:

a first cylinder having an inner wall surface extending between and open and a closed end of said cylinder,

a second cylinder concentric within said first cylinder and spaced apart therefrom to form an annular chamber between said first and second cylinders,

said second cylinder having a closed end and an open end,

said second cylinder being slidably movable in telescoping relationship between an extended and a retracted position relative to said first cylinder,

first sealing means on said first cylinder extending between said first and second cylinders to seal one end of said chamber,

gas generating means including an exit port within said second cylinder,

second sealing means extending between said gas generating means and said second cylinder,

an annular flange on said open end of said second cylinder, said flange having a periphery in continuous sealing contact with said inner wall of said first cylinder to seal the end of said annular chamber opposite from said one end of said chamber,

first port means in said second cylinder for communicating said gas generating means with said annular chamber when said second cylinder is at a first position intermediate said extended and retracted positions,

second port means on said first cylinder for communicating said chamber with outer atmosphere when said second cylinder is at a second position intermediate said extended and retracted positions, and

support means connected to said closed end of said second cylinder for supporting said mass during operation of said launching device.

3,981,094

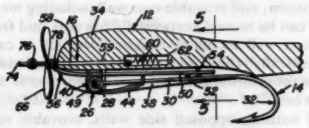
ARTIFICIAL FISHING BAIT

Myron J. Leffel, 114 W. Jefferson St., Marshfield, Wis. 54449

Filed July 10, 1975, Ser. No. 594,683

Int. Cl.[2] A01K *85/02*

U.S. Cl. 43—35 **8 Claims**



1. An artificial fishing bait, comprising, in combination:

a. a body;

b. a jaw engaging hook pivotally mounted on the body;

c. latching means mounted on the body for releasably engaging the jaw engaging hook and normally retaining the jaw engaging hook adjacent the body; and

d. bait hook means connected to the latching means for causing the latching means to release the jaw engaging hook when a predetermined force is applied to the bait hook means, the body being a longitudinally extending member having a pair of longitudinally spaced ends, with a longitudinal slot provided at one longitudinally spaced end and extending longitudinally along the longitudinal extent of the body, the jaw engaging hook being pivotally mounted at the one end of the body and normally partially disposed in the slot, and the latching means being disposed in the slot and extending from the slot away from the one end of the body for attachment to the bait hook means, the latching means including a longitudinally extending latching bar mounted in the slot of the body for sliding movement parallel to the longitudinal extent of the body, the jaw engaging hook including an apertured member provided on the shank of the jaw engaging hook, the bar normally engaging the apertured member, an end of the latching bar extending beyond the body, a pin slidably mounted in the body at the one end of the body, and the bait hook means and the extending end of the latching bar both being connected to the pin, with the pin being slidably moved under a predetermined force by the bait hook means, and the latching bar being slidably displaced by a sliding movement of the pin for disengagement from the apertured member.

3,981,095

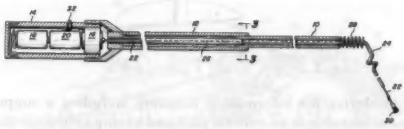
SPORT-FISHING APPARATUS

Allen A. Shepherd, R.C.S. Manufacturing Company Rte. 1, Box 266A, West Columbia, S.C.

Filed May 13, 1975, Ser. No. 577,033

Int. Cl.[2] A01K *87/00*

U.S. Cl. 43—19.2 **5 Claims**



1. A sport-fishing apparatus, comprising:

a. an elongated hollow rod having a handle at one end and a coil spring concentrically arranged at the opposite end and extending axially therefrom;

b. a hollow control tube extending through said hollow rod having one end rigidly attached to the interior of said rod and the opposite end extending outwardly of the opposite

end of said rod through said coil spring a distance substantially equal to the length of said rod;

c. a line formed of substantially torsionally stable material extending completely through said control tube;

d. a motor mounted within said handle with its shaft aligned with the longitudinal axis of said rod, one end of said line being rigidly attached to said shaft; and

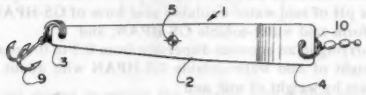
e. means on said handle for controlling the operation of said motor.

3,981,096

FISHING LURE

Harry Toivonen, 1170 Ramsey View Court, Apt. 216, Sudbury, Ontario, Canada (P3E 2E4)

Filed Apr. 18, 1975, Ser. No. 569,181
Claims priority, application Canada, May 2, 1974, 198719
Int. Cl.² A01K 85/00
U.S. Cl. 43—42.39 7 Claims



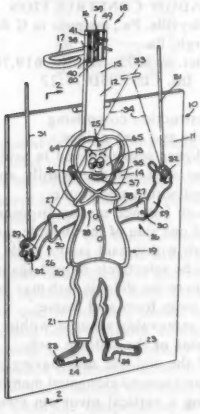
1. A fishing lure in the form of an elongate body being symmetrical about the longitudinal axis of said lure, said body comprising a substantially flat trailing end, a substantially flat leading end, and a substantially flat intermediate portion, said intermediate portion smoothly tapering in decreasing width and increasing thickness from a point closer to the trailing than to the leading end of said body to a point adjacent said leading end, said trailing end being positioned at an acute angle relative to the plane of said intermediate portion and being thin relative to the thickness of said leading end, each of said ends being adapted for attachment to a hook or fishing line.

3,981,097

ANIMATED FIGURE

Morey Bunin, 140 Riverside Drive, New York, N.Y. 10024

Filed May 30, 1975, Ser. No. 582,420
Int. Cl.² A63H 7/00
U.S. Cl. 46—126 7 Claims



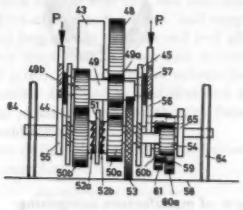
1. Animated caricature apparatus for television transmission and the like comprising a flat neutral stationary background surface member, a caricature body form mounted on said surface including an elastic body outline including arms and feet and an integrally formed elastic head outline portion, said body outline adhered only at said feet to said background surface while being otherwise movable relative thereto, a flat movable background member having a face representation thereon including eyes and slideably movable relative to said stationary member, said movable member carrying said head outline portion affixed thereto at only the upper portion thereof and being shiftable with respect to the lower portion thereof to provide facial and body distortional movement of said caricature.

3,981,098

TOY VEHICLE WITH COMPONENT FOR STORING ENERGY IN RESPONSE TO MOTION IN OPPOSITE DIRECTIONS

Helmut Darda, Im Tal, 7712 Blumberg, Germany

Division of Ser. No. 135,662, April 20, 1971, Pat. No. 3,812,933. This application Oct. 10, 1972, Ser. No. 296,165
Claims priority, application Germany, Apr. 21, 1970, 2019085; Aug. 7, 1970, 2039265; Feb. 8, 1971, 2105734
Int. Cl.² A63H 29/24
U.S. Cl. 46—206 48 Claims



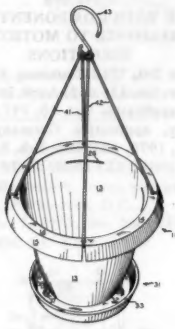
1. A mobile toy including a frame; a drive mounted in said frame, said drive comprising a first component rotatably mounted on said frame and rotatable in one and in an opposite direction; a second component rotatably mounted on said frame and rotatable in a predetermined direction; energy storing means on said frame and connected with said second component, said energy storing means being adapted to store energy in response to rotation of said second component in said predetermined direction; transmission means mounted on said frame in mechanical association with said components for effecting rotation of said second component in said predetermined direction in response to rotation of said first component, said transmission means comprising a first branch including first means adapted to link said components for transmission of motion from said first to said second component only in response to rotation of the former in said one direction, and a second branch including second means adapted to link said components for transmission of motion from said first to said second component only in response to rotation of the former in said opposite direction, so that, upon rotation of said first component, said second component is always rotated in said predetermined direction irrespective of the direction in which said first component is rotated; a shell configurated as a mobile conveyance mounted to said frame surrounding and accommodating said drive in its interior, said drive including means for moving said mobile conveyance over a supporting surface; and means for rotating said first component, including at least one wheel fixed to said first component and engageable with a supporting surface over which said mobile conveyance is adapted to travel.

3,981,099

HANGING POT WITH DETACHABLE TRAY

Ted Dziewulski, Bartlett, Ill., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 14, 1975, Ser. No. 577,493
Int. Cl.[2] A01G 9/02
U.S. Cl. 47—35 21 Claims



1. An article of manufacture comprising:

a pot having a bottom wall, a sidewall extending generally upwardly from the periphery of said bottom wall, and means secured to the upper portion of said sidewall for supporting said pot in a hanging position, said sidewall extending substantially continuously along the periphery of said bottom wall, said sidewall having a plurality of openings therein spaced horizontally from each other, at least a substantial portion of the bottom edge of each of said plurality of openings being defined by a respective generally horizontal shoulder spaced upwardly from said bottom wall top surface by a first distance,

a detachable tray having a generally horizontal solid base wall and a retaining wall extending generally upwardly from the periphery of said base wall throughout the extent of the periphery of said base wall to thereby form a receptacle capable of containing a liquid, the transverse dimensions of said base wall being substantially greater than the corresponding transverse dimensions of said bottom wall of said pot, a plurality of pillars extending generally upwardly from said base wall at locations spaced from the periphery of said base wall, each of said pillars having a hook member extending generally horizontally from the upper extent of the respective pillar toward the central vertical axis of said tray, each of said hook members being spaced a second distance above said base wall, said second distance being at least as great as said first distance, said pillars being spaced from each other in a pattern corresponding to the pattern of the locations of said plurality of openings in said sidewall of said pot so that upon positioning of said pot on said base wall coaxially with said tray said hook members enter said plurality of openings in said sidewall of said pot and engage said shoulders to thereby lock together said pot and said tray.

3,981,100

HIGHLY ABSORBENT STARCH-CONTAINING POLYMERIC COMPOSITIONS

Mary Ollidene Weaver, Peoria; Edward B. Bagley, Morton; George F. Fanta, Peoria, and William M. Doane, Morton, all of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 456,911, April 3, 1974, Pat. No. 3,935,099. This application Sept. 8, 1975, Ser. No. 611,458
Int. Cl.[2] A01C 1/06
U.S. Cl. 47—58 2 Claims

1. A method of conditioning soil comprising the steps of:

a. saponifying a gelatinized-starch-polyacrylonitrile graft polymer (GS-PAN) in an aqueous slurry with an alkali in amounts such that the molar ratio of alkali to the acrylonitrile repeating unit of said GS-PAN is from about 0.1:1 to 7:1 to form a water-soluble saponified GS-PAN (water-soluble GS-HPAN); and

b. optionally adjusting the pH of said water-soluble GS-HPAN to about 3, followed by isolating the resulting water-insoluble acid form of GS-HPAN, and readjusting the pH of said water-insoluble acid form of GS-HPAN to reform said water-soluble GS-HPAN; and

c. slurrying in an aqueous dispersion from 0.3 to 0.9 part by weight of said water-soluble GS-HPAN with about 100 parts by weight of soil; and

d. drying the slurry resulting from step (c) to a moisture level of from about 1 to 15% water by weight.

2. A method of entrapping seeds in a water-absorbent composition comprising the steps of:

a. saponifying a gelatinized-starch-polyacrylonitrile graft polymer (GS-PAN) in an aqueous slurry with an alkali in amounts such that the molar ratio of alkali to the acrylonitrile repeating unit of said GS-PAN is from about 0.1:1 to 7:1 to form a water-soluble saponified GS-PAN (water-soluble GS-HPAN); and

b. optionally adjusting the pH of said water-soluble GS-HPAN to about 3, followed by isolating the resulting water-insoluble acid form of GS-HPAN, and readjusting the pH of said water-insoluble acid form of GS-HPAN to reform said water-soluble GS-HPAN; and

c. slurrying in an aqueous dispersion said water-soluble GS-HPAN with the desired seeds; and

d. drying the slurry resulting from step (c) to a moisture level of from about 1 to 15% water by weight.

3,981,101

WINDOW CONSTRUCTION

Anthony Guzzi, Finleyville, Pa., assignor to G & S Metal Products Inc., Pittsburgh, Pa.

Filed Oct. 6, 1975, Ser. No. 619,788
Int. Cl.[2] E05D 15/22
U.S. Cl. 49—162 9 Claims

1. A window construction comprising

a frame with jambs and sash guides;

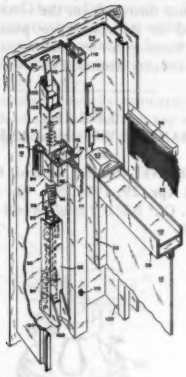
an upper and a lower sash received in said frame with at least said lower sash being upwardly and downwardly slidably received within said frame;

pressure urged sash balance means disposed between said sash guides and one side of the slidable sash for retaining the slidable sash within said jambs while permitting the slidable sash to be selectively moved against the pressure to a position where the slidable sash may be rotated about a vertical axis away from said frame;

a locking means removably secured within the jamb adjacent said one side of the slidable sash;

said one side of the slidable sash having pivoting means including first and second elongated members, one of said members having a vertical pivot pin element extending over a substantial position of the length thereof and the other of said members having a receptacle complementary in shape to said pin element, one of said members

being received in a sash guide, said one member including a restraining element shaped to cooperate with said lock-



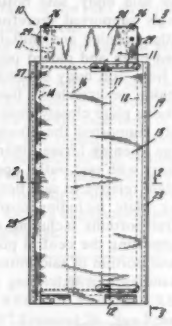
ing means to secure the slidable sash within said frame while said locking means is fixed to said frame.

3,981,102

WARP RESISTANT FIRE DOOR

Frank Stuart Harwood, Richmond Hill, and Heinz Otto Dorst, Milton, both of Canada, assignors to Dover Corporation, New York, N.Y.

Filed July 22, 1974, Ser. No. 490,486
Int. Cl.² E06B *3/16, 5/16*
U.S. Cl. 49—501 **6 Claims**



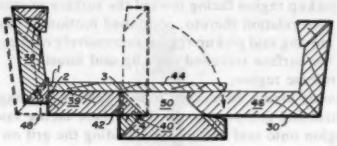
1. A warp resistant fire door comprising a rigid frame structure defining at least one major side area and a pair of opposite minor side areas adjacent said major side area, a first outer skin portion susceptible of thermal expansion and contraction overlying the frame structure at each of the side areas and non-releasably secured to the frame structure at points other than those defining said major side area, portions of the skin between said points of securement and overlying said minor side areas being spaced apart from portions of the frame defining each of said minor side areas, and heat responsive means for attaching other portions of the skin to the frame structure to provide a rigid substantially vibration-free door panel in the presence of normal ambient temperatures, said heat responsive means releasing said other portions of the skin from the frame when the temperature of the skin reaches a predetermined level, thereby to minimize warping stresses induced on the frame by thermal expansion and contraction of the skin.

3,981,103

ADJUSTABLE SPLIT DOOR JAMB

Owen Earl McAllister, Oshkosh, Wis., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 19, 1974, Ser. No. 462,475
Int. Cl.² E06B *1/10*
U.S. Cl. 49—505 **6 Claims**



1. An adjustable split door frame female member made from a monolithic base board having four v-shaped and one plowed longitudinally extending grooves and said plowed groove being located between the middle two of said v-shaped grooves, wherein the split door frame member comprising:

a. a first end formed by folding and securing said base board along two of said v-shaped grooves;

b. a second end formed by folding and securing said base board along the remaining two of said v-shaped grooves;

c. a support member attached to first and second substantially mutually perpendicular surfaces, said first surface being a surface of said first end and said second surface being a surface of said second end, said support member securing said first end to said second end after said first end has been rotated away from said second end along said plowed groove by an angle of substantially 90°;

d. a board member fastened to said first end and substantially parallel to said second end thereby forming the slot portion of said female member; and

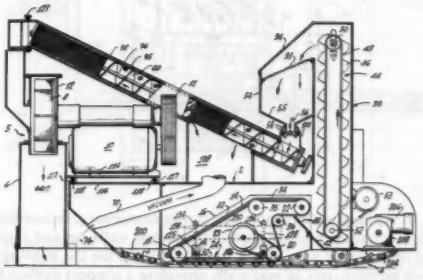
e. a single piece of flexible cladding material on one side of said female member.

3,981,104

GRIT BLASTING MACHINE AND METHOD

Alfred J. Dreher, Pasadena, Calif., assignor to Texstar, Inc., City of Commerce, Calif.

Filed Mar. 20, 1975, Ser. No. 560,356
Int. Cl.² B24C *3/06, 9/00*
U.S. Cl. 51—9 M **36 Claims**



1. A grit blasting machine for removing scale from a surface to be cleaned utilizing particles of metal grit susceptible to magnetic attraction, the grit blasting machine comprising:

a vehicle adapted for motion along the surface in a forward direction extending longitudinally of the vehicle, said vehicle having forward and rear ends;

a housing having an opening facing the surface;

means for mounting said housing on the forward end of said vehicle with said opening positioned forwardly of said vehicle;

blasting means connected to said housing for projecting the grit through said opening against the surface to remove the scale therefrom;

at least one endless belt formed from non-magnetic, magnetically permeable material;

means connected with said vehicle for supporting said belt in an endless path and for driving said belt peripherally along said path, said path including,

a pickup region facing toward the surface in spaced adjacent relation thereto, continued motion of said vehicle moving said pickup region successively over portions of the surface travelled over by said housing,

a release region;

magnetic means connected to said vehicle for magnetically attracting grit present on the surface facing said pickup region onto said belt and for holding the grit on said belt until the grit reaches said release region, the portions of said belt passing through said release region not being subjected to sufficient magnetic force to hold the grit on said belt by magnetic attraction; and

means for causing the grit to become separated from said belt during passage through said release region.

32. A grit blasting machine for removing scale from a surface to be cleaned utilizing particles of metal grit susceptible to magnetic attraction, the grit blasting machine comprising:

a vehicle adapted for forward motion in a longitudinal direction, along the surface;

a housing having a downward opening facing the surface;

traverse means mounting said housing on the forward end of said vehicle for selectively adjustable transverse motion of said housing relative to said vehicle; and

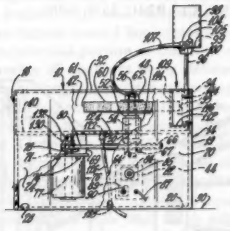
blasting means connected to said housing for projecting the grit downwardly through said opening against the surface to remove the scale therefrom.

3,981,105

LAPIDARY APPARATUS

John W. Flaherty, Galesburg, Ill.; Robert C. Ingersoll, and William F. Goodrich, both of Adrian, Mich., assignors to Dick Blick Company, Galesburg, Ill.

Filed Mar. 17, 1975, Ser. No. 559,265
Int. Cl.² B24B *7/08, 55/02*
U.S. Cl. 51—71 **11 Claims**



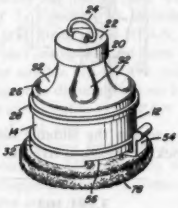
1. Apparatus for processing stones comprising, in combination, a hollow housing having connected walls, an end region of the housing providing a support surface for the housing in one position, one of said walls providing a support surface for the housing in a second position, partition means in said housing providing first and second compartments in the housing, means journally mounting a rotatable stone-processing instrumentality in said first compartment, motive means in the second compartment for rotating the stone-processing instrumentality, the housing in one position disposing the instrumentality for rotation in a substantially horizontal plane and in the second position disposing the instrumentality for rotation in a substantially vertical plane, a reservoir supported by the housing adapted to contain a liquid, tubular means connected with the reservoir for conveying liquid from the reservoir onto the stone-processing instrumentality, the end regions of the connected walls adjacent the stone-processing instrumentality having an inwardly extending flange means, said flange means and said first compartment providing a chamber for receiving liquid thrown from the instrumentality with the housing disposed in its respective positions, and a table mounted by the housing for supporting stones for processing with the instrumentality disposed in a vertical plane.

3,981,106

SCRUBBER-SANDER WITH CLEANER DISPENSING MEANS

Alfredo Gallo, 483 NE. 29th St., Miami, Fla. 33137

Filed Apr. 29, 1975, Ser. No. 572,922
Int. Cl.² B24D *17/00;* **A46B** *11/04*
U.S. Cl. 51—358 **11 Claims**



1. A scrubber body comprising a hollow body closed at its lower end by means of a bottom wall, said body including an upper filler opening for introducing a selected fluent material into said body, said bottom wall having an outlet opening formed therein for gravity discharge of fluent material therethrough from within said body, said bottom wall including valve means guidingly supported therefrom operably associated with said outlet opening and shiftable relative to said bottom wall between open and closed positions, a scrubber member supported from said body beneath said bottom wall and said outlet opening penetrable by fluent material, valve means including a valve plate closely underlying said bottom wall and oscillatably supported therefrom, said valve plate including a discharge opening formed therethrough shiftable into and out of registry with said outlet opening upon oscillation of said valve plate relative to said bottom wall, said bottom wall and valve plate including corresponding central portions, said central portions including coacting mounting means rotatably supporting the central portion of said valve plate from the central portion of said bottom wall for oscillation about an upstanding axis extending generally centrally through said body.

3,981,107

ROOF-TO-SIDEWALL JOINT STRUCTURE FOR TRANSIT VEHICLE

Theodor C. Schubach, Bonita, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Apr. 28, 1975, Ser. No. 572,124
Int. Cl.² B62D *31/02*
U.S. Cl. 52—11 **6 Claims**

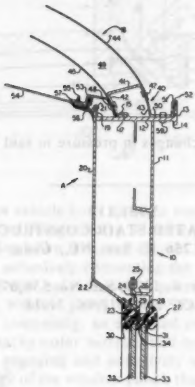
1. In a transit vehicle having two sidewalls each having an upwardly exposed joint surface along its upper edge, and a roof structure terminating along each side thereof in a downwardly exposed marginal joint surface for seating in support relation on the upwardly exposed upper surface of its respective side wall, an externally completed joint structure connecting each side of the roof structure in supported relation to the upper joint surface of the sidewall on the same side of the vehicle, said joint structure comprising:

a side flange extending laterally outwardly along the outer edge of each side of the roof structure, at least a portion

of the under surface of each of said roof structure side flanges comprising an extension of its respective downwardly exposed marginal roof surface,

a first locking flange extending laterally in one direction along each side of the roof structure and spaced inwardly, by a distance approximately the width of its respective side wall joint surface, toward the longitudinal center line of the vehicle from its respective outwardly extending roof structure side flange,

a side flange extending laterally outwardly from the upper portion of each of said sidewalls, a top surface of each of said latter flanges conforming to, and closely underlying,



the under surface of the roof structure side flange on the same side of the vehicle,

a second locking flange on each of said sidewalls and extending laterally, in the opposite direction from, and in interlocking relation with, the said first locking flange on the corresponding side of the roof structure, and

means applied by a worker exteriorly of the vehicle securely interconnecting the superposed roof and sidewall side flanges along each side of the vehicle, thereby retaining the upper portion of each side wall against movement relative to the roof structure in a direction to withdraw each said first locking engagement with its respective said second locking flange.

3,981,108

REGLET STRUCTURE

Edward T. Berg, 187 Fremont St., San Francisco, Calif. 94105

Continuation of Ser. No. 462,301, April 19, 1974. This application Apr. 23, 1975, Ser. No. 570,590

Int. Cl.[2] E04D *13/14*

U.S. Cl. 52—61 **2 Claims**

1. As a new article of manufacture, a one-piece reglet formed of extruded plastic material, adapted to be embedded in a concrete structure adjacent to one surface thereof and to hold lip-equipped flashing in place against said one surface of the concrete structure, and comprising a channel consisting of spaced apart upper and lower flanges, a substantially flat connecting bight portion extending between and connected to the inner longitudinal edge portions of the flanges, and an apron extending between and connected to the outer longitudinal edge portions of said flanges and disposed originally in substantially parallel relation with the bight portion, said flanges converging substantially uniformly in the direction of the apron, said channel being adapted in connection with formation of the concrete structure to have its apron fit flatly against a form panel while wet concrete is poured around it and against said form panel in order to form said concrete structure, and being also adapted upon hardening of the concrete and removal of the form panel to have its apron exposed as well as lie in the plane of the surface which is formed on the concrete structure by way of the form panel, said apron of the channel being provided in its outer surface and adjacent and parallel to the outer longitudinal edge portion of the lower flange with a single longitudinal groove, having its outer surface smooth and uninterrupted except for said single longitu-

dinal groove, and being adapted after removal of the form panel and longitudinal slitting of its longitudinally-grooved portion to be swung inwards and slightly upwards so that it extends inwards and downwards, provides such access to the interior of the channel as to permit entry therein of the lip of the flashing, and serves so frictionally to grip such lip as to hold the flashing in place without the use of wedges or auxiliary anchoring elements.

3,981,109

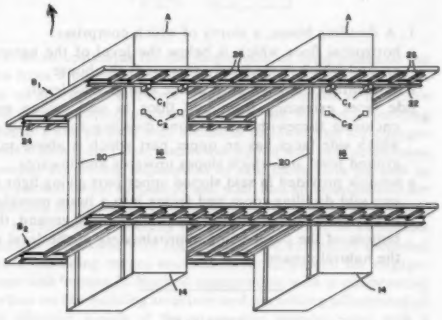
PROCESS AND APPARATUS FOR SUPPORTING HOISTED FLOORS PERIPHERALLY OF SUPPORTING TOWER

David E. Termohlen, Greenwich, Conn., assignor to International Environmental Dynamics, Inc., New York, N.Y.

Filed Oct. 24, 1974, Ser. No. 517,682

Int. Cl.[2] E04B *1/00*

U.S. Cl. 52—126 **20 Claims**



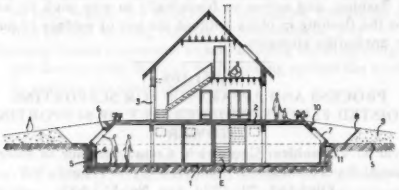
1. Apparatus for the support of a floor about at least one tower to permit a floor to be raised immediately adjacent the sidewalls of said tower and above the intended elevation of said floor and thereafter lowered onto said apparatus for the support of said floor from said tower, said apparatus comprising: a plurality of substantially horizontally disposed receptacles defined within the sidewalls of said tower immediately below the elevation of said floor, said receptacles having an elongate dimension opening at one end to the exterior or the sidewalls of said tower, said receptacles having a preselected cross section across their elongated dimension to define upper and lower supporting surfaces for supporting the weight of said floor; a correspondent plurality of bars disposed within said receptacles, said bars having an elongated dimensions

from end to end to permit said bars to fit within said receptacles to define along the sidewalls of said tower an unobstructed surface permitting said floors to be raised immediately past said receptacles with said bars therewithin; means attached to said bars for permitting said bars to be withdrawn from said receptacles to protrude under said floors in supporting relation; and, upper and lower bearing surfaces on said bars corresponding in location to the upper and lower supporting surfaces in said supporting surfaces in said receptacles when said bars are partially withdrawn for load supporting contact with said receptacles to provide a cantilever support to said bars to permit support of said floor when resting thereon.

3,981,110
DWELLING HOUSE

André Le Cornec, 30 rue de la Mairie, 91220 Bretigny-sur-orge, France

Filed Mar. 10, 1975, Ser. No. 557,026
Claims priority, application France, Apr. 18, 1974, 74.13520
Int. Cl.² E04F *17/06*; **E02D** *27/00*
U.S. Cl. 52—169 R **8 Claims**



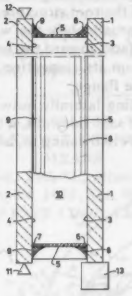
1. A dwelling house, a storey of which comprises:
a horizontal floor which is below the level of the natural ground which immediately surrounds the house;
a horizontal ceiling which is above said ground level;
side faces extending from said floor to said ceiling and enclosing therewith at least one dwelling room, one of which side faces has an upper part which is above said ground level and which slopes upwards and inwards;
a window provided in said sloped upper part giving light to one said dwelling room and facing into a basin provided in the reconstituted ground above the natural ground, the bottom of the basin being approximately at the level of the natural ground.

3,981,111
INSULATING UNIT

Nils Ture Lennart Berthagen, Manadsvagen 74, S-175 42 Jarfalla, Sweden

Filed Mar. 3, 1975, Ser. No. 554,833
Claims priority, application Sweden, Mar. 1, 1974, 7402787
Int. Cl.² E06B *3/24*, *7/12*
U.S. Cl. 52—171 **8 Claims**

1. In an insulating unit of the kind having at least two mutually opposing transparent plates joined together along their peripheral edge portions by means of a substantially gas-tight and liquid-light sealing means, said sealing means, together with said transparent plates, defining a closed, gas-tight and liquid-tight chamber and permitting movement between the plates, the improvement comprising means attached to at least one plate for allowing said one plate to pivot automatically with respect to said other plate around a fixed axis at its lower

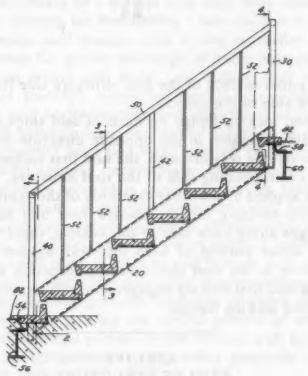


edge in response to changes in pressure in said closed chamber.

3,981,112
PREFABRICATED STAIR CONSTRUCTION

Norman W. Dake, 1756 E. Ave. NE., Cedar Rapids, Iowa 52406

Filed Dec. 6, 1974, Ser. No. 530,078
Int. Cl.² E04F *11/00*, *11/18*
U.S. Cl. 52—184 **5 Claims**



1. A prefabricated structure for a stair assembly which comprises:
a. a steel beam stringer channel disposed with the flanges of the channel extending to one side which is the outside in assembly,
b. a rail post rigidly secured at each end of the stringer channel positioned at an acute angle to the stringers wherein to be disposed in an upward vertical direction in final assembly and having a dimension transverse of the stair construction to close the flange area at the ends of the stringer channel,
c. a balustrade rail rigidly secured to the top ends of said rail posts to form a load bearing parallelogram structure with said stringers,
d. a plurality of balusters rigidly secured to a top flange of the stringer channel and to the balustrade rail to rigidify the said parallelogram structure into a structural truss, and
e. a plurality of short, tread-supporting shelves affixed in parallel spaced relation on the other side of said stringer

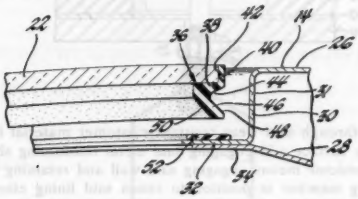
which is the inside in assembly to support the ends of a plurality of preformed treads.

3,981,113

WINDOW GLASS BONDING STRIP

Henry W. Griffin, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 12, 1975, Ser. No. 576,806
Int. Cl.[2] B60J 1/02; E06B 3/62, 3/02
U.S. Cl. 52—208 2 Claims



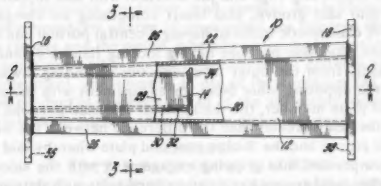
1. In a motor vehicle body having a window opening defined by a body panel flange and a window panel for closing the window opening when mounted therein, an extruded resilient bonding strip adhesively connecting the window panel to the body panel flange and adhesively providing the sole means mounting the window panel on the body panel flange, said bonding strip comprising: an extruded strip of resilient material having a tacky outer surface, said bonding strip having a body portion engaging and adhesively securing the bonding strip to the edge of the window panel, the body portion having a tacky underface facing toward the body panel flange and a continuous leg extruded integrally with the body portion of the bonding strip and depending therefrom at an acute angle with respect to the underface, said leg having first and second tacky faces, the leg engaging the body panel flange when the window panel is installed in the window opening so that the leg is folded back with one tacky surface engaging the tacky underface of the body portion and adhesively securing said leg to said body portion and the other face engaging and being adhesively secured to the body panel flange to adhesively mount said window panel on the body panel flange solely by the adhesion of the bonding strip.

3,981,114

ENERGY ABSORBING PERMANENTLY DEFORMABLE COLLAPSIBLE COLUMN

Ronald Chupick, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 13, 1975, Ser. No. 586,613
Int. Cl.[2] E04C 2/00, 3/32
U.S. Cl. 52—232 4 Claims



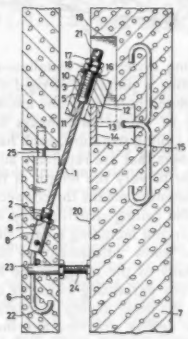
1. An energy absorbing permanently deformable collapsible column comprising; a frusto-pyramidal shaped first hollow column; a first end cap secured to and closing one end of said first column including attaching means disposed thereon for securing the energy absorbing column in an appropriate environment, a second end cap secured to and closing the other end of said first column including attaching means disposed thereon for securing the energy absorbing column in the appropriate environment; and a second hollow column disposed within said first column having one end secured to said first end cap and having the other end freely disposed at a position substantially one-half the distance between said end caps; said first column being adapted to collapse at a predetermined rate under a predetermined amount of compressive loading, said second column preventing buckling of said first column during initial collapse of said first column and also collapsing at a predetermined rate to increase the load carrying capacity of the energy absorbing column when said first column is sufficiently compressed to permit the second column to contact said second end cap.

3,981,115

MOUNTING FACIA PLATES ON BUILDING STRUCTURES

Peter Hoyer, Street No. 166 a, 8941 Egg an der Gunz, Bavaria, Germany

Filed Jan. 27, 1975, Ser. No. 544,581
Int. Cl.[2] E04B 5/57, 2/88
U.S. Cl. 52—235 3 Claims



1. In an apparatus for the suspension of facia plates or the like from a building structure comprising a suspension member of adjustable effective length having means at its upper end for suspended engagement with the wall of a building structure and formed with means at its lower end for engagement with a facia plate, means associated with said suspension member permitting adjustment of said facia plate paralell to and normal to the surface of said wall, and an arrangement for adjusting the spacing of the facia plate from said wall surface, the improvement whereby the suspension member comprises a length of flexible wire rope with a first externally-threaded sleeve including means secured to its upper end for engagement with means in hooked engagement with a cooperating portion on the building structure and permitting adjustment of the effective length of the suspension member, and with a second externally-threaded threaded sleeve secured to the lower end of the wire cable and threadedly engaged in a cooperating sleeve anchored in the facia plate, said flexible wire rope providing a universal joint connection between the building structure and facia plate, said means in hooked engagement with the building structure comprising a suspension element including a bore which at least partially, axially accommodates the first externally-threaded sleeve and being of a size to permit free angular movement relative to the longitudinal axis of the sleeve and including a slot providing for hooked engagement with the attachment means on the building structure, said first externally-threaded sleeve carrying at least one lock nut and a washer between this nut and the upper face of the suspension element, said washer having a part-spherical formation at the face thereof, contacting the suspen-

sion element for accommodating for the relative axial angular positions of the sleeve in the bore of said suspension element.

3,981,116

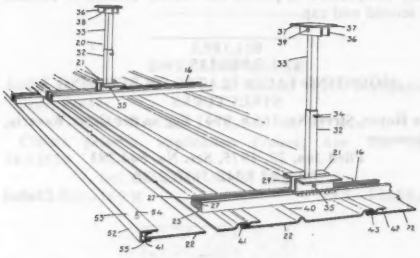
SHEATHING SYSTEM FOR BUILDING STRUCTURES

Charles Paul Reed, Scarborough, Canada, assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 370,164, June 14, 1973, abandoned. This application June 17, 1974, Ser. No. 479,639

Int. Cl.² E04B *5/52*

U.S. Cl. 52—484 **19 Claims**



1. A drop ceiling system for installation below a ceiling structure, comprising a plurality of rigid elongated stringers that are to be arranged parallel to one another in a horizontal plane, a plurality of elongated hangers for supporting the stringers from the ceiling structure, each hanger comprising a pair of rigid members that are relatively adjustable longitudinally of the hanger to vary the length of the hanger, hanger connecting and fastening means for connecting an upper end of the hanger to the ceiling structure and a lower end of the hanger to a stringer and including means slidingly engageable with a stringer to allow adjustment of the position of the hanger longitudinally of the stringer, the hanger connecting and fastening means permitting swinging of one end of the hanger relative to the other during installation to accomodate unevenness in the ceiling structure and including means for firmly fastening said rigid members together to fix the length of the hanger, the hanger connecting and fastening means when said rigid members are fastened together preventing vertical movement of the hanger longitudinally of itself relative to the ceiling structure and to the stringer whereby the hangers can rigidly space the stringers away from the ceiling structure, a plurality of moisture imprevious drop ceiling panels, means for rigidly securing the panels to the stringers to form a continuous drop ceiling and prevent relative movement between the panels and stringers, and means for sealing said drop ceiling against passage of moisture; the ceiling means, the impreviousness of the panels, the rigid securing of the panels to the stringers, and the rigid spacing of the stringers from the ceiling structure ensuring that the drop ceiling can be cleaned from below without displacement thereof and without passage of moisture therethrough.

3,981,117

LINING AND FASTENER ARRANGEMENT FOR DEVICES HAVING SURFACES SUBJECT TO WEAR

Bengt Lars Arne Dehlen, Trelleborg, Sweden, assignor to Trelleborgs Gummifabrik Aktiebolag, Trelleborg, Sweden

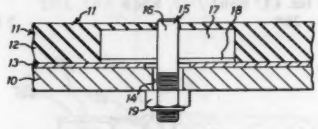
Filed May 6, 1975, Ser. No. 574,994

Claims priority, application Sweden, May 7, 1974, 7406072

Int. Cl.² E04B *1/38*

U.S. Cl. 52—509 **6 Claims**

1. A wear surface lining and anchoring means comprising a lining element including a layer of wear resistance elastomer material having metal sheet reinforcing at least along its edge portions, said metal sheet reinforcing being spaced from one surface of said layer of elastomer material, fastening means for mounting said lining element onto a wall subject to wear with the surface of said lining element opposite said one surface adjacent said wall, said fastening means including a clamping member for engaging and clamping and lining element against said wall, means on said clamping member defining an elongated knife-edge directed toward metal reinforcing sheet and



cutting through said wear resistant elastomer material from said one surface and engaging said metal reinforcing sheet, and connector means engaging said wall and retaining said clamping member in position to retain said lining element rigidly clamped on the wall by clamping action between said metal reinforcing sheet and said knife edge.

3,981,118

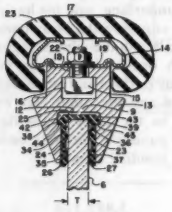
CLAMPING INSERT

Ernest D. Johnson, Tallmadge, and Hugh W. Wright, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 17, 1974, Ser. No. 515,515

Int. Cl.² E04C *2/33*; **E04F** *19/02*

U.S. Cl. 52—716 **4 Claims**



1. In combination, a plate member having a supporting edge, a grooved member having a groove of greater width than the thickness of said plate member for receiving said edge and a clamping insert for gripping the sides of said plate member at said supporting edge and for insertion with said supporting edge into said groove, said insert comprising an elongated body of elastomeric material having a central portion and side portions, said side portions having locking flanges extending outwardly from the outer faces and ribs extending inwardly from the opposing inner faces for engagement with the sides of said plate member, the thickness of said side portions and said ribs being greater than the difference between the width of said groove and the thickness of said plate whereby said ribs are compressed into gripping engagement with the sides of said plate, said groove having an end and sides with slots in the sides of said groove for engaging said locking flanges of said side portions of said clamping insert in locking engagement in said slots and said elastomeric material being stretchable whereby said clamping insert may be elongated to reduce the thickness of said side portions including said ribs to compensate for dimensional variations of the plate member, grooved member and clamping insert.

3,981,119

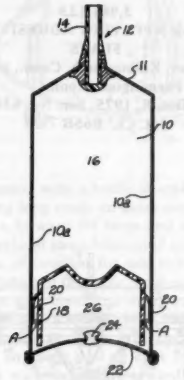
METHOD OF MAKING A PRESSURE OPERATED CONTAINER FOR DISPENSING VISCOUS PRODUCTS

Robert S. Schultz, 7 Heusted Drive, Old Greenwich, Conn. 06870

Continuation-in-part of Ser. No. 435,472, Jan. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 290,977, Sept. 21, 1972, Pat. No. 3,827,607, which is a continuation-in-part of Ser. No. 175,253, Aug. 26, 1971. This application Sept. 9, 1975, Ser. No. 611,814

Int. Cl.² B65B *31/00*

U.S. Cl. 53—37 **6 Claims**



1. The method of making a pressurized container for dispensing viscous material, which comprises selecting an open-botton cylindrical container body having a dispensing valve at its closed upper end and inverting the same to upwardly face the open bottom, introducing viscous product into the open end and in intimate void-free contact with container inner-wall surfaces including that of said upper end, selecting a cupped and relatively stiffly closed cylindrical piston body of diameter substantially less than the container-bore diameter and with a flexible peripheral seal flange integrally formed with the body near the stiffly closed end, the flange having a peripherally continuous tubular container-sealing region radially offset from the piston body and of axial extent substantially less than that of the piston body, assembling the selected piston through the open bottom of the container with the closed end of the piston in contact with the viscous product and with the tubular region extending in the direction of the open bottom, imparting a relative rotary displacement of the piston and body with respect to each other after initial piston contact with the product, closing the open bottom of the container with a bottom closure, and squeezing only the tubular region of the flange into axially extending and circumferentially continuous container wall contact by introducing a superatmospheric charge of pressurized gas between the bottom closure and the piston, whereby piston-body contact with the container wall is limited to prevention of extreme angular misalignment, and whereby in use of the container (a) maximum product is squeezed ahead of the advancing piston and (b) minimum friction characterizes piston advance.

3,981,120

BOTTLE PACKAGING MACHINE

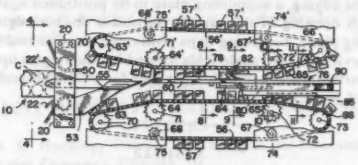
Robert H. Ganz, Saddle River, N.J., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 470,036, May 15, 1974, Pat. No. 3,940,907. This application Sept. 16, 1974, Ser. No. 506,098

Int. Cl.² B65B *21/08*

U.S. Cl. 53—48 **17 Claims**

1. An apparatus for closing filled bottle cartons wherein the cartons comprise connected side and end wall forming panels enclosing an assembly of bottles in double row arrangement with top and bottom wall forming closure panels hingedly connected to top and bottom edges of said side wall forming panels, said top wall forming closure panels having free marginal portions which are adapted to be overlapped in the plane of the top wall and which have interengaging locking means, said apparatus comprising conveyor means for supporting the bottle assemblies with the carton top wall forming panels in upstanding open relation while advancing them along a predetermined path, endless traveling conveyor means disposed for movement in horizontal planes and having opposed runs extending in spaced relation on opposite sides of said path, which conveyor means carries top wall panel engaging means, said top wall panel engaging means extending into the path of said upstanding top wall forming closure panels and engaging said panels so as to fold said panels down into top wall forming position with free marginal portions of said panels overlapped,



said top wall panel engaging means comprising a series of conveyor carried plate members having angularly related face portions positioned for engaging said top wall and said side wall panels, respectively, in areas adjacent the hinge connections between the top wall forming panels and the side wall forming panels while traveling along said opposed runs, the topmost one of said plate portions being positioned to strike the upstanding top wall closure panel above the hinged connection thereof with the associated side wall panel and the lowermost one being positioned to engage the top marginal portions of the side wall and urge the same in the direction inwardly of the carton, and holding said panels in tight relation on the bottles while the carton is advanced and plow forming devices disposed at fixed points along the top of said run which interengage said panel locking means while said top wall and side wall panels are held in tight relation on the bottles.

3,981,121

MACHINE FOR FILLING A SACK WITH PIECE GOODS AND CLOSING MOUTH OPENING OF THE SACK

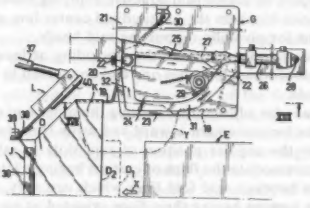
Lasse Juhani Turunen; Heikki Rimpinen; Tauno Orsma, and Aimo Peurala, all of Mantta, Finland, assignors to G. A. Serlachius Oy, Manatta, Finland

Continuation-in-part of Ser. No. 466,885, May 3, 1974, abandoned. This application July 28, 1975, Ser. No. 599,772

Claims priority, application Germany, May 7, 1973, 2322841

Int. Cl.² B65B *35/50, 7/08, 51/14*

U.S. Cl. 53—159 **4 Claims**



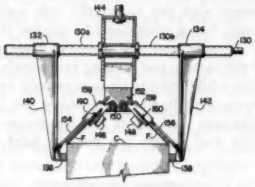
1. A machine for filing a sack of flexible material such as plastics and for closing the mouth opening of the sack to form

a carrying handle comprising sorting means for stacking piece-goods into a predetermined shape; closing means for folding and seaming the mouth opening of said sack when filled, said sorting means and said closing means being arranged after each other for operating in predetermined sequence, revolving means between said sorting means and closing means and having filling racks and being displaceable in a transverse plane with respect to said line between a ready-for-operation position, in which said filing rack is positioned outside said line to receive an empty sack, and a sacking position, in which said filling rack is positioned on said line to push goods into the sack and to push the filled sack to said closing means; said closing means comprising two spreading devices positioned on different sides of the mouth opening of the sack, said devices having fingers adapted to grip the mouth opening of the sack and to stretch said mouth opening to form a narrow opening, so that the free side walls of said sack mouth opening are at least positioned substantially opposite each other to form a double edging, a supporting plate to be positioned against the mouth opening of the sack to turn said double edging to a closing plane, two swing flaps positioned close to said spreading devices to turn angle folds formed by said fingers upon said supporting plate, and welding means for welding together said folded angle folds.

3,981,122
APPARATUS FOR APPLYING ADHESIVE TO CARTON FLAPS

Lloyd D. Johnson, Portland, Conn., assignor to Emhart Industries, Inc., Hartford, Conn.

Filed Dec. 8, 1975, Ser. No. 638,770
Int. Cl.² B65B 7/20
U.S. Cl. 53—374 **6 Claims**



1. In an apparatus for feeding erected cartons in a downstream longitudinal direction, said cartons having side panels with closure flaps pivotally connected thereto on laterally spaced longitudinally extending fold lines aligned with the downstream direction, the improvement comprising:

a. positioning means for orienting said flaps at predetermined equal but opposite angles of 90° or less measured with respect to the plane defined by the fold lines,

b. adhesive applying heads having guides for receiving and applying a band of adhesive to said flaps oriented at said predetermined angles,

c. support means for said adhesive applying heads, including a pivot block on the longitudinal center line of the apparatus for pivotally supporting said heads,

d. said support means further including at least two links each of which links has one end connected to one of said heads,

e. means for adjustably mounting the other end of both said links for movement toward and away from said block to vary the angular position of said slots in said heads to accommodate the flaps of cartons having a lateral dimension between said fold lines which can vary, the smaller size cartons having their flaps oriented at steeper angles and larger cartons at shallower angles, the adhesive applying heads being movable only angularly relative to said block,

f. side guide structure for engaging said carton side panels.

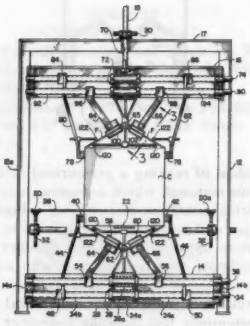
g. said means for adjustably mounting the other ends of said links including at least one laterally extending shaft having right hand and left hand threaded portions, and correspondingly threaded nuts to which said other ends of said links are pivotally connected to achieve said movement toward and away from said block, and

h. said left and right hand threaded nuts also comprising a portion of said guide structure whereby the side guides are moved toward and away from one another in the same amount as movement of said other ends of said links.

3,981,123
APPARATUS FOR APPLYING ADHESIVE TO CARTON FLAPS

Thomas L. Flanagan, Killingworth, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Dec. 8, 1975, Ser. No. 638,769
Int. Cl.² B65B 7/20
U.S. Cl. 53—374 **6 Claims**



1. In an apparatus for feeding erected cartons in a downstream longitudinal direction, said cartons having side panels with closure flaps pivotally connected thereto on laterally spaced longitudinally extending fold lines aligned with the downstream direction, the improvement comprising:

a. positioning means for orienting said flaps at predetermined equal but opposite angles of 90° or less measured with respect to the plane defined by the fold lines,

b. adhesive applying heads having guides for receiving and applying a band of adhesive to said flaps oriented at said predetermined angles,

c. support means for said adhesive applying heads, including a pivot block on the longitudinal center line of the apparatus for pivotally supporting said heads,

d. said support means further including at least two links each of which links has one end connected to one of said heads, and

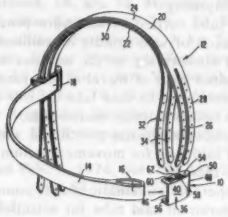
e. means for adjustably mounting the other end of both said links for movement toward and away from said block to vary the angular position of said slots in said heads to accommodate the flaps of cartons having a lateral dimension between said fold lines which can vary, the smaller size cartons having their flaps oriented at steeper angles and larger cartons at shallower angles, the adhesive applying heads being movable only angularly relative to said block.

3,981,124

CONCHO

Charles E. Kibler, 8325 E. Indian Bend Road, Scottsdale, Ariz. 85253

Filed Sept. 10, 1975, Ser. No. 611,959
Int. Cl.² B68B 1/04
U.S. Cl. 54—6 R 3 Claims



1. The combination, with a bridle assembly which includes a brow band having loop ends, an outer overhead strap bifurcated to provide a forward bit strap and an aft throat latch strap, an inner overhead strap bifurcated to provide front and rear hanger straps, of conchos for said straps, comprising:

a concho at each end of the brow band, each concho having an outer plate with inner and outer surfaces, upper and lower edges, and forward and rear edge portions;

a rear wall extending inwardly from each of the rear edge portions, and an inside wall on each of the rear walls;

top and bottom walls extending inwardly from the upper and lower edges;

said top and bottom walls being fixedly secured to the respectively adjacent rear and inside walls;

the top and bottom walls having series of co-aligned slots formed therein;

the brow band extending into the conchos with the loop ends thereof encased in said conchos and bearing against the rear walls thereof;

the slots in the conchos being aligned with said loop ends, and the slots including enlarged outer slots, the overhead straps with said bit strap and throat latch strap entering through the loop and outer slots, and pairs of longitudinally aligned forward and rear inside slots, the front pin strap extending through the loop and forward inside slots, and the rear hanger straps extending through the loop and the rear inside slots.

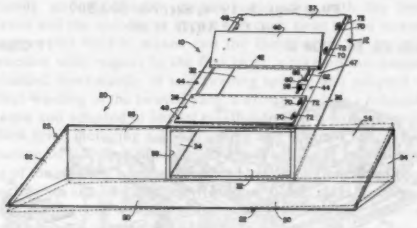
3,981,125

LEVELING MECHANISM FOR HARVESTER HEADERS

Dathan R. Kerber, Bettendorf, Iowa; Thomas A. Hocking, Colona, and John L. Vande Wiele, Moline, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Feb. 12, 1975, Ser. No. 549,244
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.² A01D 41/04
U.S. Cl. 56—14.5 8 Claims

1. In an agricultural implement, the combination with a feeder having a generally rectilinear tubular housing provided with a rectangular forward open rim, said housing including a transverse bottom wall, upstanding side walls, and a transverse top wall having a proximate edge fixedly secured to the upper edge of one of said side walls and a free distal edge disposed in longitudinal register with the upper edge of the other side wall, and a crop-gathering header including a bottom wall and an upstanding rear wall which extends across said open rim and is secured thereto, cooperating means on the free distal edge region of said top wall and the adjacent side wall for regulably shifting such region longitudinally along the upper edge of such side wall in either direction to thereby distort the forward rim region of the housing and effect relative vertical shifting movement of forward edge regions of the side walls



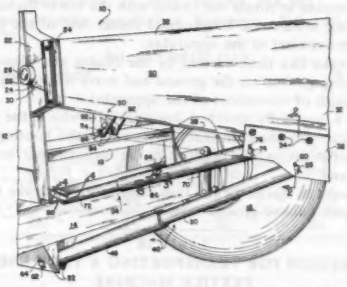
and consequent rocking movement of the header casing bodily as a unit.

3,981,126

SAFETY SUPPORT FOR HARVESTER COMBINE FEEDERS

Thomas A. Hocking, Colona, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Mar. 17, 1975, Ser. No. 558,973
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976
Int. Cl.² A01D 41/06
U.S. Cl. 56—15.9 11 Claims



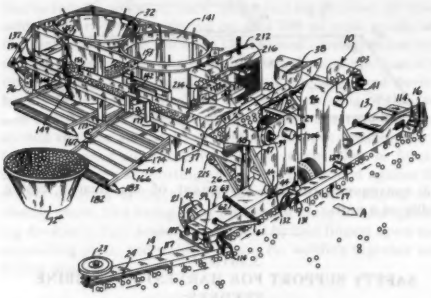
1. In a harvester combine having a framework including a horizontally disposed transverse axle housing, a crop feeder pivoted at its rear end to the forward end of the combine framework for swinging movements between an operative crop infeed position and a raised inoperative position, and at least one hydraulically operable lift cylinder effective between said framework and feeder for producing such swinging movements, the improvement which compresses an extensible and contractible brace-like safety stand effective in compression between said axle housing and feeder for maintaining the latter in a predetermined elevated position, said safety stand comprising at least one extensible and contractible pair of telescopic inner and outer parts including a forward part effectively pivoted to a forward region of the feeder and a rearward part engageable with said axle housing when said stand is in its fully extended position, a removable pin projecting diametrically through said outer part and serving to maintain the stand in such fully extended position, and a parking bracket fixedly secured to said feeder rearwardly of the point of pivotal connection between said forward part and the feeder and the effective to support the rear end portion of the rear part when said pin is removed and said stand is contracted.

3,981,127

APPARATUS FOR GATHERING AND CONTAINERIZING CITRUS FRUIT AND THE LIKE

Lucius N. Smith, Montverde, Fla. 32756

Filed Sept. 3, 1974, Ser. No. 502,509
Int. Cl.² A01D 51/00
U.S. Cl. 56—328 R 17 Claims



1. In apparatus for gathering fruit such as oranges and the like lying on the ground,

a. a wheel supported frame adapted to move alongside a row of trees from which the fruit has fallen,

b. a laterally extending conveyor and pick-up mechanism carried by the frame comprising:

1. a pair of spaced generally horizontal chains and the like having upper and lower flights,

2. means to rotate the chains with the lower flights moving toward the longitudinal center line of the path of movement of the apparatus,

3. rake-like tines carried by the chains and disposed to engage fruit on the ground and move it inwardly of the path of movement of the apparatus

4. a vertically directed housing into which the chains carrying the fruit laden tines enter, the housing being effective to hold the fruit on the vertically moving tines, and

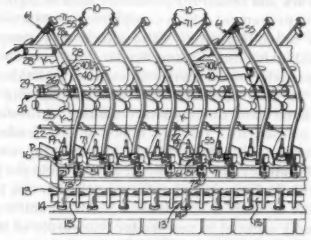
c. means to discharge the thus raised fruit from the tines at a point above ground level.

3,981,128

MECHANISM FOR TRANSPORTING A YARN END IN A TEXTILE MACHINE

Gert Munker, Krefeld, Germany, assignor to Palitex Project-Company G.m.b.H., Dusseldorf, Oberkassel, Germany

Filed June 26, 1975, Ser. No. 590,429
Claims priority, application Germany, July 29, 1974, 2436433
Int. Cl.² D01H 15/00, 1/10, 7/86
U.S. Cl. 57—34 R 28 Claims



14. In a textile yarn processing machine, such as a twister, spinning frame or the like, having a plurality of side-by-side spindle assemblies for the processing of yarn and each of which includes a carrier mechanism for supporting a supply package of yarn to be withdrawn and processed and a takeup roll mechanism for the winding of the yarn after processing and being positioned above said carrier mechanism; the combination therewith of a mechanism for receiving an end of the continuous yarn being processed at the vicinity of said carrier mechanism, for transporting the yarn end along a predetermined desired path of travel and for positioning the yarn end at the vicinity of said take-up roll mechanism to facilitate yarn piecing or start-up of the yarn processing operation, said mechanism comprising

an elongate tube carried by said yarn processing machine adjacent each of said spindle assemblies and extending along and conforming to the contour of the predetermined desired path of travel of the yarn end from said carrier mechanism to said take-up roll mechanism and defining a hollow interior therewithin,

a freely displaceable piston positioned within said hollow interior of said tube for movement within said tube along the length thereof,

selectively operable pneumatic means connected with said hollow interior of said tube for selectively moving said piston from one end to the other end thereof,

a freely slideable, ring-like member positioned at least partially around the outside of said tube for movement on said tube along the length thereof,

means magnetically coupling said piston and said ring-like member through said tube for movement of said ring-like member with said piston, and

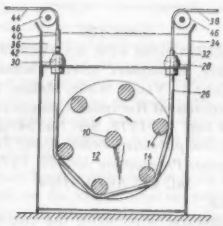
gripper means carried by said ring-like member for holding the yarn end during selective movement by said pneumatic means of said piston and said ring-like member along said tube transporting the yarn end along the predetermined desired path of travel.

3,981,129

METHOD AND DEVICE FOR THE FELTING OF SLIVER AND SUCHLIKE INTO FELTED YARNS

Henricus Cornelis Johannes Briaire, Nootdorp, Netherlands, assignor to IWS Nominee Company Limited, Ilkley, England

Filed May 2, 1975, Ser. No. 573,826
Claims priority, application Netherlands, May 16, 1974, 7406622
Int. Cl.² D04H 17/00
U.S. Cl. 57—35 7 Claims



1. A method of felting wool-containing fibres consisting essentially of the steps of

a. providing a flexible guide tube;

b. passing wet wool-containing fibres through said guide tube; and

c. simultaneously with step (b), flexing said guide tube.

4. A method according to claim 1, for producing a felt yarn from fibers wherein false-twist is imparted to the fibers before they are passed into the guide tube whereby to promote entanglement of the fibres.

3,981,130

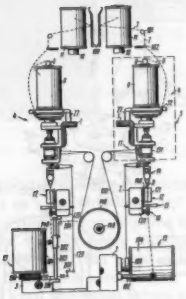
SINGLE PROCESS TWISTING MACHINE FOR PRODUCING TWISTED YARN FROM TWO STRANDS

Mark Borisovich Aimbinder, ulitsa Predslavinskaya, 47, kv. 32; Mikhail Iosifovich Zhitomirsky, Vozdukhoflotsky prospekt, 103/2, kv. 26, both of, Kiev; Maria Vasilievna Denisova, 1 Krasnoarmeisky pereulok, 11, kv. 12, Mytischi Moskovskoi oblasti; Anatoly Mikhailovich Grabilin, ulitsa Entuziastov, 29, kv. 14, Kiev; Grigory Alexeevich Lapushkin, Yasny proezd, 18, kv. 72, Moscow; Moisei Zusievich Kupershmidt, ulitsa Rovenskaya, 7, kv. 55, Kiev; Jury Alexeevich Mazov, ulitsa 1 Sportivnaya, 3, kv. 7, Mytischi Moskovskoi oblasti; Viktor Petrovich Terentiev, Kolomievsky pereulok, 3/1, kv. 75, Kiev; Jury Vasilievich Sergeev, ulitsa Pervomaiskaya, 25, kv. 74, Mytischi Moskovskoi oblasti, and Vladimir Sergeevich Muzylev, stantsia Zagoryanskaya, ulitsa Kalinina, 59, Severnaya zheleznaya doroga, all of U.S.S.R.

Filed Feb. 1, 1974, Ser. No. 438,773

Int. Cl.[2] D01H 7/86

U.S. Cl. 57—58.3 **17 Claims**



1. In a single-process twisting machine for production of twisted yarn from two strands and having a plurality of work stations arranged along a longitudinal axis of the machine, each said work station comprising: a framework; a twisting spindle mounted for rotation on said framework and adapted to impart first and second twists to the strands; an arbor provided on said twisting spindle, the arbor being arranged vertically and having top and bottom ends; a radial passage provided in said arbor; a through axial passage provided in said arbor; a twisting disc associated with said spindle and having a hollow radial tube communicating through said radial passage with said axial passage of said arbor; a stationary first holder associated with said spindle adapted to support the bobbin of the supply package of the first stand, the first holder being mounted above said twisting disc on said top end of said arbor; a through passage provided in said stationary first holder coaxially with said axial passage in said arbor to offer a single through passage for the strand paid off the package of the bobbin on said stationary first holder; a first means for tensioning the strand paid off the bobbin of said stationary first holder, the first means mounted on said stationary holder and adapted for rotation under the action of the strand paid off the bobbin; a second holder for the bobbin of the supply package of the second strand, the second holder mounted on said framework outside said twisting spindle; a second means for tensioning the second strand, the second means being mounted on said second holder and adapted to maintain a permanent tension of the second strand passing through said hollow tube of said twisting disc and said axial passage on said arbor; a third means for balancing the tensioning of the two strands leaving said axial passage of said arbor prior to imparting a second twist to the strands and forming the twisted yarn, the third means being mounted on said bottom end of said arbor and actuated by the strands; a feed-in means for effecting uniform forwarding of the strands from said respective supply packages; the feed-in means being mounted downwardly of said twisting spindle and separate from the spindle under said third means for balancing the tensioning of the strands, and the feed-in means cooperating with the third means and the spindle to impart a second twist to the strands between the feed-in means and the third means of opposite direction with respect to the first twist; a take-up mechanism mounted downwardly of said twisting spindle and adapted to effect winding of the twisted yarn; a drive including a rotatable sheave and adapted to impart rotation to said twisting spindle; a first drive including a dog coupling and adapted to transmit rotation to said feed-in means to effect said uniform forwarding of the strands; a second drive including a ratchet-and-pawl mechanism adapted to supply rotation to said take-up mechanism to effect the winding of the twisted yarn; a fourth means for synchronous starting and arresting of said respective drives of said spindle, of said feed-in device, and of said take-up mechanism, the fourth means being operatively connected with said drives; a pickup responsive to the tension of the twisted yarn, associated with said synchronous starting and arresting device, and adapted to transmit an actuating signal to said last-mentioned device at slackening of the twisted yarn to simultaneously disable both of said drives, said pickup being arranged intermediate of said feed-in means and said third means for balancing the tensioning of the strands.

3,981,131

HIGH SPEED TWISTING MACHINE

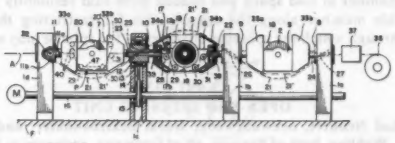
Wolfgang Hartig, Remscheid; Dietrich Berges, Marienheide, and Heinz Schippers, Remscheid, all of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Feb. 11, 1975, Ser. No. 548,982

Claims priority, application Germany, Feb. 16, 1974, 2407473

Int. Cl.[2] D01H 1/10

U.S. Cl. 57—58.54 **9 Claims**



1. In a high-speed twisting machine including (a) a plurality of individual rotors which are arranged in alignment one behind the other, which are driven at the same rotational speed and which contain guides for wires linearly intersecting the common twisting axis of the rotors, (b) a plurality of spool carriers which are rockingly mounted between two individual rotors, (c) feed spools on which wire is stored, each spool being mounted for rotation in one of the spool carriers, (d) guide means which are connected for outward extension from the individual rotors and which serve to guide the wire arriving at the rear outlet end of the machine from the front end thereof around the spool carriers and feed spools situated in the rearward direction of wire travel and (e) a winding means at the outlet end of the machine to take-up the plied and twisted wires, the improved combination in said machine for two-for-one twisting which comprises:

rotors having hollow axial passages; and

spool carriers having deflection means for guiding the wires which are initially forwardly drawn off through the axis of the rotors so as to pass said wires around each feed spool in the forward take-off direction, the last rotor at the front end of the machine having a guide over which the wires after being drawn off forwardly through the axis of the rotors and collected into a bundle are deflected outwardly to be returned to the rear outlet end of the ma-

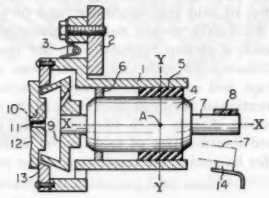
chine while forming individual balloons between each two adjacent rotors.

3,981,132

DEVICE FOR SUPPORTING A SPINDLE OF AN OPEN-END SPINNING APPARATUS

Tsutomu Miyazaki; Takashi Kato, and Noriaki Miyamoto, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Daiwa Boseki Kabushiki Kaisha, Osaka, both of, Japan

Continuation of Ser. No. 429,351, Dec. 28, 1973, abandoned.
This application Oct. 20, 1975, Ser. No. 624,299
Claims priority, application Japan, June 29, 1973, 48-78070
Int. Cl.² D01H *1/12, 7/12*
U.S. Cl. 57—58.89 **2 Claims**



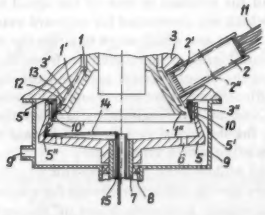
1. In a device for supporting a spindle of an open end spinning apparatus of the type having a spinning chamber coaxially secured to an end of said spindle, said spindle being driven by a driving belt at a free end thereof, a frame support rigidly mounted on said spinning apparatus, a cylindrical bushing member secured to said frame support, a bearing rotatably supporting said spindle, and a ring shaped resilient yieldable member rigidly inserted in a space between said cylindrical bushing member and said bearing for supporting said bearing; the improvement comprising an additional ring shaped member rigidly positioned at a location adjacent to said spinning chamber in said space and spaced from said resiliently yieldable member along the spindle axis for restricting the arc through which the spinning chamber of the spindle may move.

3,981,133

OPEN-END SPINNING UNIT

Rolf Neubert, Schwanewede; Harm Schiebenhöfer, and Rolf Wehling, both of Bremen, all of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Sept. 23, 1975, Ser. No. 616,038
Claims priority, application Germany, Oct. 4, 1974, 2447339
Int. Cl.² D01H *1/12*
U.S. Cl. 57—58.95 **19 Claims**



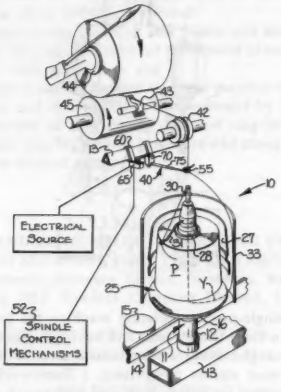
1. In an open-end spinning unit having a spinning rotor presenting an entrance opening, a break-up roller mounted for rotation coaxially with the spinning rotor and having a frontal end section at the end thereof directed toward the spinning rotor, and a housing enclosing at least part of the break-up roller, the improvement comprising a fiber collecting ring located between, and coaxial with, said spinning rotor and said break-up roller, and supported by said housing, said fiber collecting ring protruding axially, in the direction away from said spinning rotor, beyond said frontal end section of said break-up roller and, in the direction toward said spinning rotor, beyond said entrance opening of said spinning rotor, the inner surface of said ring facing said break-up roller and serving at least partially as a fiber guiding surface.

3,981,134

YARN GUIDE EYELET AND MONITORING MECHANISM IN A TEXTILE YARN PROCESSING MACHINE

Willy Heimes, Krefeld, Germany, assignor to Palitex Project-Company G.m.b.H., Krefeld, Germany

Filed July 3, 1975, Ser. No. 592,736
Claims priority, application Germany, July 11, 1974, 2433226
Int. Cl.² D01H *13/16*
U.S. Cl. 57—81 **13 Claims**



1. In a textile yarn processing machine, such as a two-for-one twister and the like, having spindle assembly stations for the processing of yarn and each including means forming a rotating balloon of running yarn during such processing and spindle control mechanisms, such as start and stop devices; the combination therewith of a yarn guide eyelet and monitoring mechanism at each of said spindle assembly stations for operating said spindle control mechanisms in response to the absence and presence of yarn running through said yarn guide eyelet and monitoring mechanism, said yarn guide eyelet and monitoring mechanism comprising:

a yarn guide eyelet positioned in said spindle assembly station for limiting the upper end of the rotating balloon of yarn during passage of the running yarn therethrough which causes forces on said eyelet in the running direction of the yarn;

a generally flat, leaf spring mounted on one side to said machine and movably supporting and carrying said eyelet on the other side thereof and biasing said eyelet into a predetermined position in the absence of yarn running through said eyelet and allowing angular, non-swivelable movement of said eyelet in the running direction of the yarn out of the predetermined position by bending of said spring under the influence of the forces acting on said eyelet in the presence of yarn running through said eyelet; and

means operatively connected with said spindle control mechanisms and being responsive to the positioning of

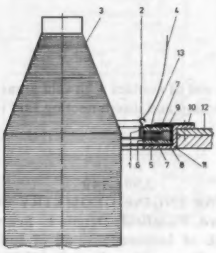
said eyelet into and out of the predetermined position thereof for operating said spindle control mechanisms.

3,981,135

SPINNING RING SUPPORTED BY A SLIDER BEARING

Wolfgang Huber, Schweinfurt, and Horst G. Schrecke, Dittelbrunn, both of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Nieuwegein, Netherlands

Filed Dec. 23, 1974, Ser. No. 535,974
Claims priority, application Germany, Jan. 30, 1974, 2304324
Int. Cl.[2] D01H 7/56
U.S. Cl. 57—124 13 Claims



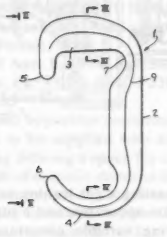
1. A bearing-supported spinning ring construction including a spinning traveler or a spinning loop, and comprising a ring rail rotatably supporting said spinning ring by means of a slider bearing, said slider bearing being equipped at its bearing surfaces with a plurality of flat grooves for the exclusively automatic production of an aerodynamic or hydrodynamic pressure taking up axial and radial forces resulting from relative motion between said spinning ring and said ring rail.

3,981,136

EAR-SHAPED RING TRAVELERS FOR YARN TWISTERS

Robert L. Goerens, Esch sur Alzette, Luxemburg, Assignor to Uniroyal Luxembourg Steinfort, Luxembourg

Filed Mar. 14, 1974, Ser. No. 451,297
Claims priority, application Germany, Mar. 26, 1973, 2314891
Int. Cl.[2] D01H 7/60
U.S. Cl. 57—125 9 Claims



1. An ear-shaped ring traveler designed for movement in only one given direction along a ring of a yarn twister or like machine,
   a. said traveler having a main body section, first and second transverse end sections extending generally codirectionally from the opposite ends of said main body section, and first and second mutually inwardly directed hook-like ends at the extremities of said end sections, respectively,
   b. of which, when the traveler is in use, said main body section extends generally vertically across and moves translationally along the inside face of the ring, said first and second end sections extend generally horizontally outwardly across and move translationally along the upper and lower edges of the ring, respectively, and said first and second hook-like ends extend downwardly and upwardly, respectively, over and more translationally along the outside face of the ring,
   c. and said traveler having aerodynamically streamlined cross-sectional contours at all essential transverse planes thereof taken through said main body section and said end sections perpendicularly to the longitudinal dimensions of the respective sections for minimizing air resistance to movement of said traveler in said given direction,
   d. the cross-sectional configuration of each of said sections at each of the respective essential transverse planes thereof being generally oblong in shape and having, as viewed with reference to said given direction of movement, a relatively blunt leading edge and a relatively less blunt trailing edge.

3,981,137

METHOD OF SPINNING TEXTILE FIBERS

Ernst Fehrer, Auf der Gugl 28, Linz, Austria

Filed May 5, 1975, Ser. No. 574,264
Claims priority, application Austria, May 30, 1974, 4497/74
Int. Cl.[2] D01H 1/12
U.S. Cl. 57—156 2 Claims

1. A method of spinning textile fibers, which comprises
   1. causing a stream of a predetermined amount of air to impinge on an air-permeable collecting surface disposed in a sharply defined suction zone,
   2. entraining textile fibers having a predetermined maximum length by the air stream to cause the fibers to be delivered to the collecting surface and to form a sliver thereon,
   3. sucking approximately the same amount of air through the collecting surfaces as the amount of air in said stream,
   4. drawing the sliver from the collecting surface in a predetermined direction,
      a. the length of the suction zone in said direction being approximately the same as the maximum length of the fibers and
      b. the width of the suction zone perpendicular to said direction being approximately the same as the diameter of the sliver,
   5. twisting the sliver after it has been drawn from the collecting surface to form a thread, and
   6. drawing off the thread while holding it against rotation.

3,981,138

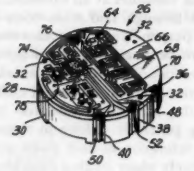
DIGITAL DISPLAY TIMEPIECE

Morris M. Levine, Scarsdale, and Arthur F. Cake, Smithtown, both of N.Y., assignors to Uranus Electronics, Inc., Port Chester, N.Y.

Division of Ser. No. 365,570, May 31, 1973, abandoned. This application Dec. 2, 1974, Ser. No. 528,798

Int. Cl.² G04C 3/00

U.S. Cl. 58—23 R 6 Claims



1. An electronic timepiece comprising:

a casing having a plurality of push buttons on the sides thereof with at least one projecting from the side of the casing laterally in the plane of the casing and another terminating in a head substantially flush with a peripheral side surface of the casing, said casing having a window closing the top thereof;

digital time display means under said window controllable by said push buttons;

electronic timing assembly means within said casing, said electronic timing assembly means including a logic means and a digit driver means affixed to a single printed circuit board means on an insulate base structure, said base structure supporting contacts along the side thereof aligned with said push buttons for completing a circuit from said logic means to said digit driver means to actuate said digital display means, said printed circuit board means having openings receiving locator pins of said insulate base structure, which locator pins extend upwardly above said printed circuit board means; and

a cover over said electronic timing assembly means under said window having an opening exposing only said digital time display means to the window of said casing, said locating pins preventing said cover from contacting said logic means.

3,981,139

SELF CONTAINED BATTERY OPERATED CLOCK FABRICATED ON A SINGLE PRINTED CIRCUIT BOARD

Reinhard Jäckle, St. Georgen, Germany, assignor to Gebruder Staiger, Fabrik fur Feinmechanik und Elektrotechnik — Kunststoffspritzerei, St. Georgen, Germany

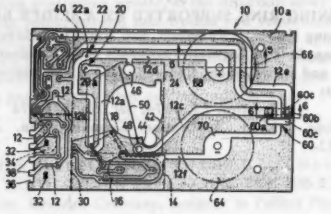
Filed Jan. 20, 1975, Ser. No. 542,240

Claims priority, application Germany, Jan. 24, 1974, 2403289

Int. Cl.² G04C 3/00

U.S. Cl. 58—23 R 7 Claims

1. In an electric clock having a printed circuit board with a plurality of conductive areas plated thereon for interconnecting an electromechanical movement mounted on the printed circuit board with a group of modules and for interconnecting the modules, each module having at least one electric terminal, said group comprising a quartz controlled electric oscillator, a drive circuit controlled by the oscillator, an alarm signal source, an alarm release switch operated by the movement for closing the circuit of said alarm signal source, contacts of a manually operated alarm stop switch for breaking said circuit and a battery also having terminals, each of said modules and said battery being arranged on said printed circuit board with at least one of said terminals of each module and battery being in direct contact with selected ones of said conductive areas, with said alarm stop switch comprising a manually operated conductive member slidably contacting said printed circuit board, said conductive member being movable to a first position in direct contact with two of said conductive areas and to



a second position out of contact with said areas for selectively electrically connecting and disconnecting said two conductive areas.

3,981,140

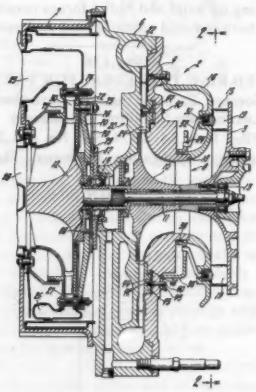
GAS TURBINE ENGINE GEOMETRY CONTROL

Jimmy L. Lunsford, Plainfield; Dennis E. Schroff, and David R. Steffey, both of Indianapolis, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed June 23, 1975, Ser. No. 589,470

Int. Cl.² F02C 9/02

U.S. Cl. 60—39.03 6 Claims



1. A method of operating a gas turbine engine including a compressor, combustion apparatus, and a turbine driving the compressor, and having variable compressor and turbine geometry, the method comprising

varying concurrently the flow areas through the compressor and the turbine as a function of engine power level request in normal load-powering operation of the engine to vary the flow capacity of the engine

and closing the compressor variable geometry while opening the turbine variable geometry to spoil the power output of the engine for load-braking operation of the engine.

3,981,141

FUEL CONTROL SYSTEM FOR GAS TURBINE ENGINE

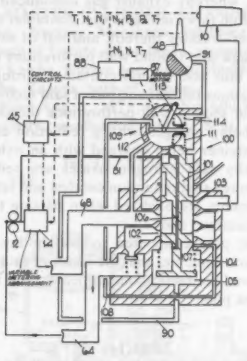
Trevor Stanley Smith, Sutton Coldfield, England, assignor to Joseph Lucas Industries, Birmingham, England

Continuation of Ser. No. 485,881, July 5, 1974. This application Jan. 12, 1976, Ser. No. 648,018

Claims priority, application United Kingdom, July 18, 1973, 34136/73; Oct. 31, 1973, 50565/73

Int. Cl.[2] F02C 9/08, 9/10

U.S. Cl. 60—39.28 R 8 Claims



1. A fuel control system for a gas turbine engine, comprising a pump, a variable metering device downstream of said pump, a control valve downstream of said variable metering device, said variable metering device including a control member movable in response to engine speed to vary fuel flow through said device, said control valve having an inlet communicating with said variable metering device and first and second outlets respectively communicating with burners of the engine and with an upstream side of said pump, said control valve having a control element movable in response to an increase in a servo pressure signal to open said first outlet and shut said second outlet, a pilot valve responsive to an increase in engine speed to reduce said servo pressure signal, and a limiting valve which is progressively shut by said control valve control element as the latter moves to shut said first outlet, said limiting valve being in series with said pilot valve whereby reduction of said servo pressure signal by said pilot valve is limited by said limiting valve.

3,981,142

CERAMIC COMBUSTION LINER

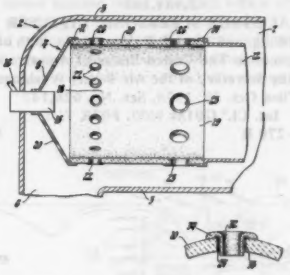
John A. Irwin, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 1, 1974, Ser. No. 456,603

Int. Cl.[2] F02G 3/00; F23D 15/02

U.S. Cl. 60—39.65 5 Claims

1. A combustion apparatus comprising, in combination, a housing adapted to be supplied with air, a combustion liner within the housing defining a space for combustion of fuel, the liner having a wall of ceramic material defining the exterior of the liner and defining spaced ports through the wall for admission of air into the liner from within the housing, the major part of the exterior surface of the liner being exposed to the air within the housing, the air being significantly cooler than the liner in normal operation of the combustion apparatus, and means for reducing thermal stresses in the wall due to local cooling of the wall by air streams entering through the wall by reducing transfer of heat from the wall to the streams, the said means comprising a lining for each port extending through the port, the lining isolating the wall from the air stream and having structure resisting heat transfer from the wall through the lining into the air stream, the lining being a coating on the wall of the port which is bonded to the wall and which coating is of a material sufficiently plastic at normal



operating temperature to yield without breaking in accommodation to expansion and contraction of the wall.

3,981,143

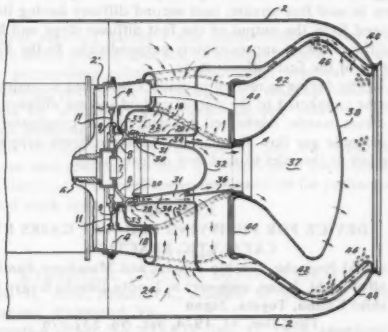
INFRARED SUPPRESSOR

Thomas D. Ross, West Palm Beach, and Samuel S. Owen, Jupiter, both of Fla., assignors to The United States of America as represented by the Secretary of the Army, Alexandria, Va.

Filed Aug. 15, 1974, Ser. No. 497,786

Int. Cl.[2] F02K 1/26; F02C 7/18

U.S. Cl. 60—264 1 Claim



1. In an infrared emission suppression exhaust fluid nozzle for a jet engine whose hot exhaust gases flow through turbine blades journaled to a turbine shaft, the exhaust fluid nozzle being the type including a tubular casing, an inner plug mounted coaxially within the casing, the periphery of the plug and the inner casing wall forming an engine exhaust duct of tortuous configuration such that the casing inlet and outlet are concealed from each other to block direct radiation of engine infrared radiation sources, and means for cooling portions of the exhaust duct casing and of the plug walls to reduce their infrared emissivity level, the combination of (a) a blower coaxially mounted on the turbine shaft at its aft end to be driven thereby, said blower having circumferentially disposed blades revolving annularly about the turbine axis, (b) a blower inlet plenum to reduce blower inlet air turbulence and to promote even distribution of inlet air to the blower and (c) means to supply air to said blower inlet plenum, with (d) a blower outlet duct, and a blower outlet cone coaxially disposed within the blower outlet duct to form an annular blower air outlet diffuser duct, and (e) a blower air outlet diffuser splitter ring positioned in said diffuser duct to split the blower airstream to divert one part of the blower outlet air to the plug

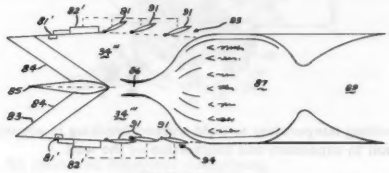
wall cooling means and to divert another part of the blower outlet air to the exhaust duct casing cooling means.

3,981,144

DUAL STAGE SUPERSONIC DIFFUSER

Robert W. Milling, and Hans J. P. Von Ohain, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 28, 1975, Ser. No. 626,147
Int. Cl.² G01M 9/00; F02K 7/10
U.S. Cl. 60—270 R **8 Claims**



1. A two stage supersonic diffuser, comprising: a gas flow passage; means for providing a supersonic gas flow through said passage; means for providing a first diffuser stage within said passage; said first diffuser stage including means for providing at least one diffuser throat inclined at a predetermined angle with respect to the direction of gas flow through the passage, to thereby form a free stream, at the output of the first diffuser stage, flowing at a predetermined angle with respect to the direction of flow upstream of the first diffuser stage; a second diffuser stage in gas receiving relation to the flow in said free stream; said second diffuser having its inlet spaced from the output of the first diffuser stage and having a diffuser throat approximately perpendicular to the diffuser throat of the first diffuser stage.

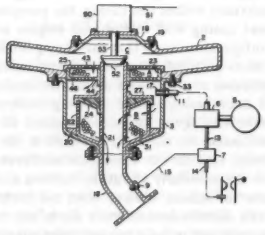
7. The device as recited in claim 1 including a ramjet combustor connected to the output of said second diffuser stage; a thrust nozzle connected to said ramjet combustor; said supersonic gas flow through said passage being supplied by ram air at the inlet to said first diffuser stage.

3,981,145

DEVICE FOR PURIFYING EXHAUST GASES BY CATALYTIC REACTION

Masaaki Noguchi; Tsuchio Bunda, and Masaharu Sumiyoshi, all of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 31, 1974, Ser. No. 537,778
Claims priority, application Japan, Apr. 3, 1974, 49-38185
Int. Cl.² F01N 3/15
U.S. Cl. 60—288 **14 Claims**



1. A device for purifying exhaust gases from an internal combustion engine by reducing nitrogen oxides and oxidizing unburned gas components in the exhaust gases by means of a catalytic reaction, comprising:

a. an exhaust manifold connected to said engine for receiving the exhaust gases therefrom;

b. a hollow cylindrical casing vertically disposed from and integrally connected to said exhaust manifold;

c. first and second cylindrical catalyst containers vertically disposed within said exhaust manifold and said hollow cylindrical casing, said first and second cylindrical catalyst containers being in series relation with respect to gas flow, said first and second cylindrical catalyst containers having first cylindrical walls and second cylindrical walls which have perforations thereon through which exhaust gases flow, whereby exhaust gas introduced in said exhaust manifold flows into said first container through said first wall perforations thereof, and out of said first container through said second wall perforations thereof, and then flows into said second container through said first wall perforations thereof and out of said second container through said second wall perforations thereof, said first container being charged with a reduction catalyst, said second container being charged with an oxidation catalyst, whereby said nitrogen oxides are reduced when passing through said reduction catalyst and said unburned gas components are oxidized when passing through said oxidation catalyst; and

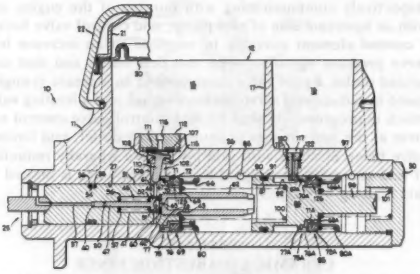
d. an exhaust pipe connected to said hollow cylindrical casing in such a manner that the inside of said second wall of said second container communicates with the inside of said exhaust pipe.

3,981,146

VARIABLE RATIO MASTER CYLINDER

Mark J. Fogelberg, Elk Grove Village, Ill., and Frank E. Hill, Warren, Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 13, 1972, Ser. No. 288,817
Int. Cl.² B60T 11/12
U.S. Cl. 60—574 **15 Claims**



1. A variable ratio master cylinder including a housing defining a fluid reservoir; a stepped bore defined by said housing including a large diameter portion and a small diameter portion, said large diameter portion having an end wall; a piston operable within said small diameter bore and said large diameter bore; a seal associated with said piston and reciprocable relative thereto and adapted in one position to divide said large diameter bore into a first chamber defined rearwardly of said seal and a second chamber defined between said seal and said end wall; a differential area metering valve carried by said piston and disposed between said first and second chambers adapted to meter fluid from said second chamber to said first chamber when a predetermined pressure differential exists between said first and second chambers, said metering valve including a head portion and a rearwardly extending valve stem terminating in an end directly exposed to atmospheric pressure, said valve head portion having a valve opening area exposed to the pressure in said second chamber, a valve closing area, smaller than said valve opening area due to the valve stem extending therefrom, exposed to

the pressure in said first chamber and biasing means urging said valve to a closed position and a fluid outlet in communication with said second chamber; said metering valve opening and closing in a sequence of operations as the pressure increases in said second chamber due to movement of said piston from an initial predetermined pressure differential until a higher predetermined pressure differential is reached where upon the valve remains open throughout the remainder of the piston movement.

3,981,147

MASTER CYLINDER ASSEMBLY

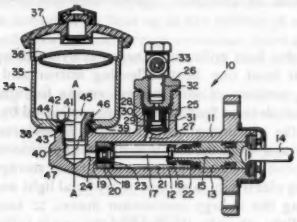
Masashi Ban, Kariya; Masakazu Ishikawa, and Hiroshi Uemura, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 1, 1975, Ser. No. 600,956

Claims priority, application Japan, Sept. 25, 1974, 49-115975

Int. Cl.² F15B 7/08

U.S. Cl. 60—585 **8 Claims**



1. A master cylinder assembly for brakes or clutch system comprising

a metallic housing provided with an opening and screw-threads on said opening,

a plastic reservoir including a bottom wall provided with an opening, said opening being located coaxially with said opening in the housing,

a metallic sleeve having a radial flange made integrally therewith, said sleeve being integrally associated with the opening in the bottom of the reservoir,

a seal rubber mounted on said bottom wall of plastic reservoir to be interposed between said bottom wall and said housing, and an axial flow passage and

a bolt having a head to engage said radial flange of sleeve and passed through said sleeve to mesh with said screw-threads on said opening of housing,

whereby rotation of said bolt causes said plastic reservoir to be secured to said metallic housing and said seal rubber to be compressed between said bottom wall of plastic reservoir and said housing.

3,981,148

COMBINED FLUID MOTOR AND PUMPING APPARATUS

Walter L. McLuckie, Coal City, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 29, 1974, Ser. No. 465,145

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

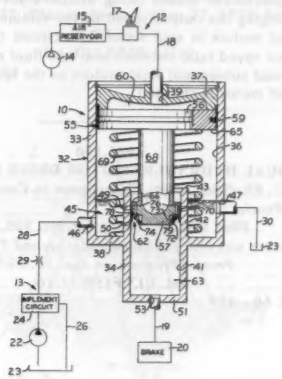
Int. Cl.² F15B 7/10

U.S. Cl. 60—592 **7 Claims**

1. A combined fluid motor and pumping apparatus for pressurizing a closed hydraulic circuit work system upon selective actuation of such apparatus by a source of pressurized air, comprising;

piston means having a pair of axially spaced motor and pump piston ends;

an upright housing providing a predetermined upper motor portion having said motor piston end of said piston means slidably mounted therein and a lower pumping portion having said pump piston end slidably mounted therein, said motor portion being provided with a lower end and said pumping portion being provided with a predetermined upper segment extended into said motor portion and having an open upper end disposed a predetermined distance above said lower end of the motor portion, said



upper segment having a size diametrically smaller than said motor portion to define an annular chamber disposed in surrounding relation to said upper segment of the pumping portion for providing an oil makeup reservoir;

means for selectively communicating said reservoir with said pumping portion; and

means for automatically replenishing any oil consumed from said reservoir so that the reservoir is continuously maintained with a sufficient amount of oil for recharging said work system as required.

3,981,149

HYDRAULIC CASCADE DRIVE SYSTEM

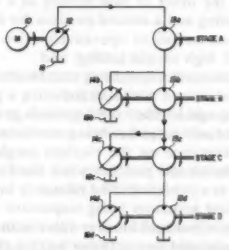
Richard M. Rice, Afton, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 433,838, Jan. 15, 1974, abandoned. This application June 6, 1975, Ser. No. 584,520

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² F15B 11/16

U.S. Cl. 60—424 **18 Claims**



1. A cascade fluid drive system comprising:

a power supply having a variable displacement fluid pump and means for driving said pump;

a plurality of fluid motors arranged in series flow circuit with each other and said fluid pump so that a change in the output of said pump tends to cause a change in the output speeds of said fluid motors; and

variable fluid-displacement means for selectively varying the amount of fluid directed to at least one of said fluid motors to change its speed without changing the output speed ratio between said one fluid motor and an adjacent fluid motor in said series flow circuit; said variable fluid-displacement means being effective for synchronously changing the output speed of the remaining subsequent fluid motors in said series flow circuit to maintain the same speed ratio between said one fluid motor and each of said subsequent fluid motors as the speed of said one fluid motor is changed.

3,981,150

DUAL HYDRAULIC MOTOR DRIVE SYSTEM

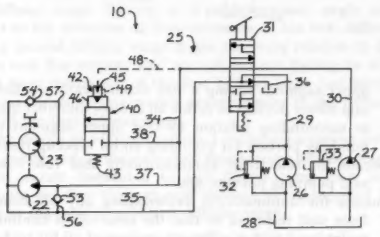
Larry G. Eftefield, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 23, 1974, Ser. No. 535,386

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² F15B *11/16*

U.S. Cl. 60—425 **7 Claims**



4. A dual hydraulic motor drive system for driving a material loading elevator for a self-loading scraper vehicle, comprising:

a source of fluid pressure;

first and second hydraulic motors drivingly connected to said elevator;

a fluid circuit for selectively communicating said source of fluid pressure to said motors including a blocker valve movable between a first position for blocking fluid to one of said motors so that said elevator is operatively driven solely by the other of said motors at a high speed, low torque setting and a second position for directing fluid to both of said motors to operatively drive said motor at a low speed, high torque setting; and

means for automatically shifting said blocker valve between its first and second positions including a pair of actuators for shifting said blocker valve towards its second position, with one of said actuators being continually responsive to loading resistance on the elevator to shift said blocker valve to its second position when the loading resistance increases to a predetermined relatively high level, and the other of said actuators being responsive to loading resistance only when said blocker valve is in its second position to assist said one actuator so that the blocker valve is held in its second position until such time that the loading resistance subsides to a level substantially lower than said high level.

3,981,151

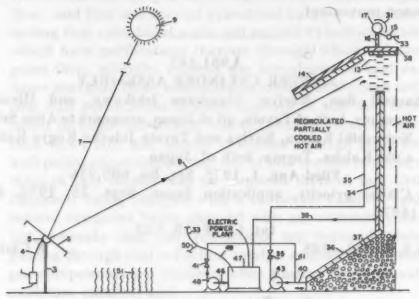
USE OF SOLAR ENERGY HEAT GATHERING AND STORING SYSTEMS TO INCREASE FARM CROP YIELDS

John C. St. Clair, Box 216, R.R. 5, London, Ohio 43140

Filed Jan. 20, 1975, Ser. No. 542,384

Int. Cl.² F24J *3/02*

U.S. Cl. 60—641 **4 Claims**



1. A solar heat collecting energy conversion system comprising: at least one heat reflecting mirror and means for changing position of said mirror, means for absorbing and storing heat derived from solar energy reflected by said mirror whereby the position of the mirror can be adjusted to reflect the sun's rays when the sun is in different positions in the sky, energy conversion means connected to said storage means for generating electricity, a source of artificial light and means for connecting the energy conversion means to said source of artificial light whereby the light of the sun is reflected by the mirror onto the heat absorbing means when the sun is shining and when the sun is not shining the source of artificial light is reflected by the mirror on crops growing on the ground and thus increase the growth of the crops.

3,981,152

QUICK EGRESS FROM DEEP UNDERGROUND

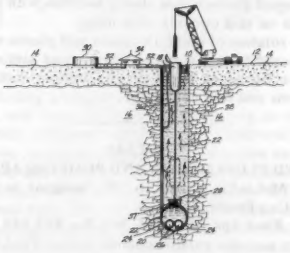
Nelson Edward Funston, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 28, 1975, Ser. No. 554,283

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² B65G *5/00, 53/00*

U.S. Cl. 61—.5 **9 Claims**



1. A method for storing and accessing a container in an environment highly resistive to damage from nuclear attack or other explosive conditions comprising the steps of:

a. excavating a shaft into the earth, said shaft being of a diameter sufficient to allow debris descending in said shaft to bypass a container rising in said shaft and also sufficient to allow said container to negotiate any bends

and discontinuities in said shaft, said shaft being of a depth sufficient to provide protection from nuclear blasts for objects buried at said depth;

b. placing first means for the storage of water at the bottom of said shaft, saif first means for the storage of water having means for directing water into said shaft substantially at the bottom thereof;

c. placing pressure means at the bottom of said shaft, said pressure means being in communication with said first means for the storage of water causing water contained in said first means for the storage of water to be discharged through said means for directing water into said shaft when said pressure means is activated;

d. filling said first means for the storage of water with water;

e. affixing a storage container to the bottom of said shaft by tether means, said tether means being able to allow said storage container to rise to the top of said shaft and further being able to draw said storage container to the bottom of said shaft, said storage container being of a density when loaded less than that of quicksand;

f. filling said shaft with saturated sand;

g. using said water contained in said first means for the storage of water to fluidize said saturated sand into quicksand to access said storage container by allowing said storage container to float up to the surface of said quicksand and drawing said storage container down against the buoyant force of said quicksand with said tether means; and,

h. allowing said quicksand to de-fluidize and return to the state of being saturated, compacted sand with said storage container at the bottom of said shaft to store said storage container in a nuclear explosion proof environment.

3,981,153

BODY PLATE SERVING TO SECURE DRAIN PIPES IN EMBANKMENTS

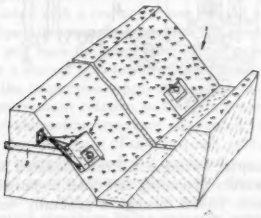
Walter Bleek, Am Juffernbach 12, 44 Munster-Handorf, Germany

Filed Jan. 17, 1975, Ser. No. 541,861

Claims priority, application Germany, Mar. 21, 1974, 2413526

Int. Cl.[2] F16L *9/00*

U.S. Cl. 61—16 **5 Claims**



1. Multiple component apparatus for securing drain pipes in embankments comprising a body plate member (4) having opposite end edges and opposite side edges, and having a generally rectangular cutout (5) of predetermined depth therein opening from one edge thereof, means for holding said body plate member in position on the embankment with said cutout surrounding the drain pipe, insert plate means having an opening (10) to accept the drain pipe and being insertable, in locking fashion, in said cutout of said body plate member, said cutout having lateral edges that run parallel to each other and into which is inserted said insert plate means, said insert plate means comprising a plurality of generally rectangular insert plates (9, 11, 12) one of which displays said opening (10), said insert plates being of different heights, the combined heights of which equal said predetermined depth of said cutout such that compensation for deviations in the predetermined height of the drain pipe in the embankment is permitted.

3,981,154

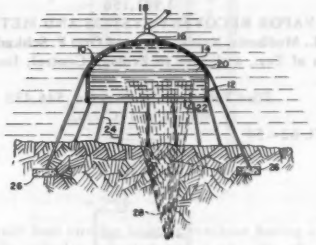
SYSTEM FOR RECOVERING PETROLEUM FLUIDS FROM UNDERWATER FISSURES

Charles M. Hix, Jr., Bryan, Tex., assignor to Arcadia Refining Company, Tyler, Tex.

Continuation-in-part of Ser. No. 879,653, Nov. 25, 1969, Pat. No. 3,675,427. This application Mar. 27, 1970, Ser. No. 23,343

Int. Cl.[2] E02B *15/04*

U.S. Cl. 61—101 **1 Claim**



1. A method for recovering fluids lighter than water escaping from an underwater fissure in the bed of a body of water, comprising the steps of completely submerging in said body of water a tank large enough to form an underwater pool capable of receiving and accumulating a large volume of said escaping fluids, said tank having an open bottom, substantially filling said tank with water, positioning said tank while substantially filled with water generally vertically above the fissure to first receive fluid escaping from said fissure after said tank is completely submerged so that said escaping fluid is recovered by rising upwardly in the said tank through the bottom thereof and displacing the water in said tank, making said tank buoyant, bouyantly suspending said tank above said fissure out of engagement with the underwater surface, accumulating said escaping fluid in said tank in a pool submerged completely underwater while said tank is buoyantly suspended submerged completely under water, and anchoring said tank from said underwater surface to maintain said tank in a substantially fixed position.

3,981,155

PLASMA DEPOSITED RIDER RINGS FOR HOT DISPLACER

Helmut L. Kroebig, Rolling Hills, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

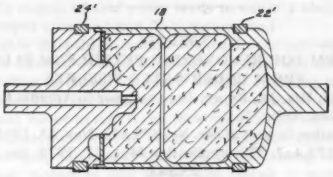
Filed Mar. 10, 1975, Ser. No. 556,988

Int. Cl.[2] F25B *9/00*

U.S. Cl. 62—6 **3 Claims**

1. In combination with a hot displacer, for a cryogenic refrigerator, having a first rider ring groove near the top of the displacer and a second groove near the bottom of the displacer, a plasma spray deposited rider ring in each of said grooves, of a corrosion and abrasion resistant material, which

has been machined to the desired width and diameter after deposition; said rider rings having a plurality of flat surfaces



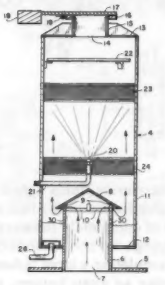
machined on the outer surface for permitting gas to pass along the hot displacer wall.

3,981,156

VAPOR RECOVERY SYSTEM AND METHOD

Jerry L. Modisette, Nassau Bay, and Otto F. Schkade, Houston, both of Tex., assignors to Ecology Control, Inc., Houston, Tex.

Filed Feb. 3, 1975, Ser. No. 546,453
Int. Cl.² F17C 7/02
U.S. Cl. 62—54 **27 Claims**



1. A method of recovering vapors from containers of volatile substances comprising the steps of:
   a. providing a scrubber connected to the vapor space of said container for receiving a flow of vapors therefrom;
   b. providing absorber fluid by taking a stream of said container substances and removing the more volatile components thereof;
   c. cooling said absorber fluid;
   d. introducing said cooled absorber fluid into said scrubber for intimate contact with said flow of vapors; and
   e. returning the vapors absorbed in said scrubber by said cooled absorber fluid to the container.

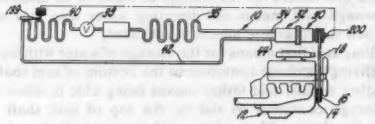
3,981,157

AUTOMOTIVE AIR CONDITIONING SYSTEM WITH VARIABLE SPEED TRACTION DRIVE TRANSMISSION

Dennis A. Black, Dayton, and Byron L. Brucken, Miamisburg, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 1, 1975, Ser. No. 573,613
Int. Cl.² B60H 3/04
U.S. Cl. 62—243 **3 Claims**

1. An automotive air conditioning system comprising a compressor, a condenser, expansion valve means and an evaporator, means for connecting said condenser, expansion valve and evaporator in series refrigerant flow relationship, means for controlling the coolant passing through said series connected refrigerant system including a variable speed transmission including a pulley adapted to be connected to an output shaft of a vehicle engine, an input shaft connected to said pulley, a planet carrier having first and second axially spaced end plates thereon, a first plurality of friction means on one of said end plates and a second plurality of friction means on the other of said end plates, first reaction means operably associated with said first plurality of friction means, an output shaft, second reaction means on said output shaft operatively



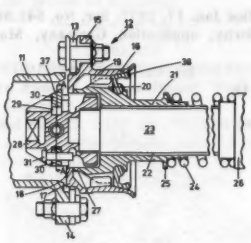
connected to said second plurality of friction means, a power transfer spool located centrally within said carriage and axially shiftable with respect to said first and second plurality of friction means for operatively varying the power transfer between said first and second plurality of friction means to control transfer of speed from said input shaft to said output shaft thereby to control the operative speed of the compressor to vary the quantity of refrigerant flow through said series connected refrigerant system.

3,981,158

DISCONNECT COUPLING FOR DRIVE SHAFTS

Kenneth Watson, Yeovil, England, assignor to Westland Aircraft Limited, Yeovil, England

Filed Jan. 6, 1975, Ser. No. 538,726
Claims priority, application United Kingdom, Jan. 14, 1974, 1693/74
Int. Cl.² F16D 3/00
U.S. Cl. 64—6 **13 Claims**



1. In a helicopter having a tail rotor located adjacent the end of a rearwardly extending tail cone comprising forward and rear sections joined through a generally vertical hinge located at one side thereof, and a tail rotor drive shaft extending along the tail cone, a disconnect coupling located in the drive shaft so as to enable the rear section of the tail cone to be pivoted about the hinge, wherein the disconnect coupling comprises a flexible disc member connected through alternate bolted flange attachments to one drive shaft part and to a generally cylindrical drive member having at one end a radially inwardly extending flange with a cental aperture and internal gear teeth adjacent to its other end, said gear teeth being arranged to mesh with external gear teeth on a gear having; internal axial splines in engagement with splines on a second drive shaft part, a retaining member secured at the end of said second drive shaft part for protrusion through the central aperture in the flange of the said drive member when the coupling is engaged, the retaining member housing a plurality of flyweights arranged to be retained in a retracted position within the member when the coupling is stationary to

permit axial separation of the parts by movement of the retaining member through the said flange aperture, each flyweight being automatically extended during rotation of the coupling to a position in which such axial separation is prevented by abutment between the extended flyweights and the adjacent surface of the said flange.

3,981,159

TEXTILE-PATTERN-PEG SELECTION AND INSERTION ARRANGEMENT

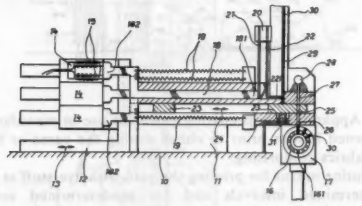
Werner Scherzinger, Bisingen, Germany, assignor to Mayer & Cie. Maschinenfabrik, Tailfingen, Germany

Filed Sept. 4, 1974, Ser. No. 503,512

Claims priority, application Germany, Sept. 5, 1973, 2344634

Int. Cl.² D04B 37/00

U.S. Cl. 66—1 R **16 Claims**



1. In a patterning arrangement for textile machines and the like, particularly for circular knitting machines, of the type wherein pattern pegs are inserted into peg-receiving holes in a pattern peg carrier provided with spaced rows of such peg-receiving holes, in combination, holding means for holding a pattern peg carrier of the type provided with spaced rows of peg-receiving holes; a plurality of peg supply passages having respective peg discharge end sections disposed in correspondence to the disposition of peg-receiving holes in one row of the carrier; a stationary guide structure; a plurality of selector slide-bars corresponding in number to the number of peg-receiving holes in one row of the carrier, said selector slide-bars being mounted for longitudinal sliding movement on said stationary guide structure, each of said selector slide-bars being associated with a respective one of said supply passages and being operative in a first position for preventing the discharge of a peg from the respective supply passage and being operative in a second position for permitting the discharge of a peg from the respective supply passage; a carriage mounted for sliding movement relative to said stationary guide structure; a peg-transporting structure connected to said carriage and sharing the movement of said carriage, said peg-transporting structure being provided with a row of peg-receiving portions disposed in correspondence to the disposition of peg-receiving holes in one row of the pattern peg carrier, said peg-transporting structure being movable with said carriage between a first location and a second location, said second location being a peg-receiving location adjacent said peg discharge end sections for receiving pegs from selected ones of said peg supply passages in dependence upon the positions of said selector slide bars, and said first location being a peg-insertion location; peg-inserting means operative when said peg-transporting structure moves to said peg-insertion location for removing the transported pegs from said peg-receiving portions of said peg-transporting structure and furthermore operative for pushing the pegs into peg-receiving holes of the pattern peg carrier; and a plurality of magnet units mounted on said carriage for movement therewith and separately activatable for causing selected ones of said selector slide-bars to share the movement of said carriage and move to said second position when said peg-transporting structure moves to said second location.

3,981,160

NEEDLE SELECTING MEANS

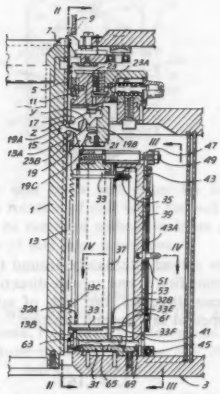
Oberdan Balzano, and Lando Dondoli, both of Florence, Italy, assignors to Billi S.p.A., Florence, Italy

Filed Apr. 29, 1974, Ser. No. 465,149

Claims priority, application Italy, Apr. 27, 1974, 9437/73

Int. Cl.² D04B 9/00

U.S. Cl. 66—50 R **3 Claims**



1. In a multi-feed circular knitting machine having a frame and a needle cylinder provided with a plurality of vertical grooves circumferentially arranged about the needle cylinder and a vertically reciprocable knitting needle and jack mounted in each said groove, each jack having a lower butt and a plurality of pattern butts, a pattern mechanism comprising a block attached for radial adjustment to the frame and radially aligned with a feed station, a plurality of radially movable pattern blades arranged in superposed relation to each other on the block and selectively engagable with jacks at the feed station, spring means normally urging the blades away from the jacks, said pattern mechanism also including a stand removably attached to said block and said stand having two rows of vertically arranged holes on its inner surface for the selective reception of pins which are removable but stationary in use and engagable with opposed blades supported by the block to overcome said spring means and protect the blades radially inwardly to actuate the jacks according to a desired pattern, each blade including a stepped profile on one and selectively engagable with a jack and a corresponding stepped profile on the other end selectively engageable with a pin in said stand whereby each of the said two rows corresponds to one of the stepped portions on said other end of the blade.

3,981,161

PANTY HOSE WITH REINFORCED LONGITUDINAL WAIST OPENING

Paolo Conti, and Massimo Bianchi, both of Florence, Italy, assignors to Billi, S.p.A., Florence, Italy

Filed Apr. 12, 1974, Ser. No. 460,581

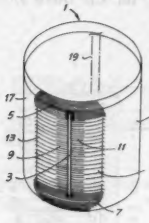
Claims priority, application Italy, Apr. 13, 1973, 9418/73

Int. Cl.² A41B 9/08

U.S. Cl. 66—177 **1 Claim**

1. A knit construction for the waist portion of a one-piece panty hose comprising a longitudinally extending waist opening, a reinforced band of fabric surrounding said opening and comprising successive courses each of which is a partial course extending between an edge of said opening and a second position arcuately spaced around the circumference of said panty hose from said opening, said reinforced band including an auxiliary reinforcing yarn in selected courses, said

reinforced band also including an inner edge zone immediately adjacent the edges of said opening in which selected stitches of selected courses are combined with the corresponding stitches of successive courses, and wherein said



partial courses extend alternately around the circumference from said opening first in one arcuate direction and then in the opposite arcuate direction, the ends of said partial courses being overlapped at said second position.

3,981,162

CONTINUOUS TREATMENT OF TEXTILE MATERIALS

Shimon Klier, 4 Simtat Magal, Savyon, Israel

Filed Nov. 26, 1973, Ser. No. 418,870

Claims priority, application Israel, Nov. 29, 1972, 40966

Int. Cl.[2] D06B *3/04, 3/24, 23/18*

U.S. Cl. 68—5 E **7 Claims**

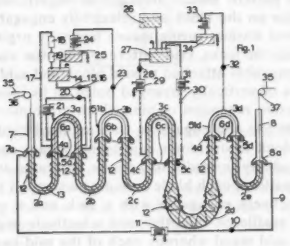


Fig. 1

1. Apparatus for the continuous treatment of generally continuous textile material, comprising:

at least one treatment zone having defined ingress and egress;

inlet and outlet sealing zones disposed in fluid communication with the respective ingress and egress of said treatment zone, a sealing liquid flow path effecting communication betwen said sealing zones while bypassing said treatment zone, said sealing zones containing sealing liquid which is substantially inert with respect to said material and any treatment substance; and

propelling means for propelling said textile material through said at least one treatment zone and constituted by means for causing forced circulation of said sealing liquid through said sealing zones and said sealing liquid flow path in a predetermined direction thereby entraining said textile material into movement in said direction.

3,981,163

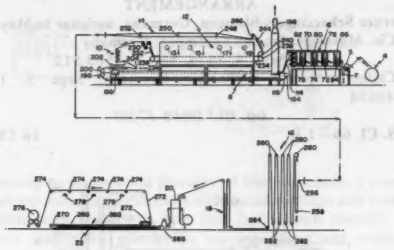
APPARATUS FOR TREATING YARNS

John G. Tillotson, Dalton, Ga., assignor to Tillotson Corporation, Needham, Mass.

Division of Ser. No. 432,449, Jan. 11, 1974, Pat. No. 3,898,035. This application Apr. 23, 1975, Ser. No. 570,765

Int. Cl.[2] D06B *1/14, 21/00, 11/00*

U.S. Cl. 68—5 D **14 Claims**



1. Apparatus for preparing yarns for use in manufacturing patterned fabrics prior to either storing the yarns or making the fabrics comprising:

printing means for printing the yarn with dye-stuff at predetermined intervals and for predetermined sectional lengths thereof;

timing means for controlling the printing means;

at least one first exit roller positioned to lead the yarn from the printing means, the timing means being energized by said exit roller, said first exit roller letting the yarn, upon exit therefrom, fall downwardly by gravitational force;

control means operatively connected between said exit roller and the timing means, said control means when in a first condition thereof permitting operation of the timing means by the first exit roller, and when in a second condition thereof disengaging the timing means from said first exit roller while simultaneously applying a brake to the timing means to hold the latter immobile during the time said control means is in its second condition;

a first restraining means positioned below the first exit roller and adapted to receive the yarn and restrain its motion as it falls downwardly;

a steam chamber for fixing the dye-stuff on the yarn and positioned below the restraining means;

a first conveyor belt having entrance and exit ends, at least the upper reach of the belt passing through the steam chamber, said entrance end being adapted to receive a yarn in plaits thereon as the yarn leaves said first restraining means;

nip rolls at the exit end of the first conveyor belt and positioned so that the plaits of yarn pass through the nip of said rolls before leaving the first belt;

washing means adjacent said nip rolls adapted to pull the yarn from said nip rolls;

a second exit roller pulling the yarn from washing means and thereafter letting the yarn fall downwardly by gravitational force;

second restraining means positioned below the second exit roller and adapted to receive the yarn and restrain its motion as it falls;

a drying chamber for drying the yarn and positioned below the second restraining means;

a second conveyor belt having entrance and exit ends, at least the upper reach of the belt passing through the drying chamber, said entrance end being adapted to receive yarn in plaits thereon as the yarn leaves said second exit roller;

nip rolls at the exit end of the second conveyor belt and being positioned so that the plaits of yarn pass through

said nip rolls before leaving said second conveyor belt; and

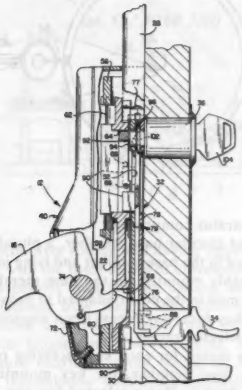
means for removing said yarn from said second conveyor belt.

3,981,164

EXIT LOCK HAVING CASSETTE MECHANISM

Walter O. Balducci, New Britain, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 478,340, June 10, 1974, abandoned.
This application Mar. 24, 1975, Ser. No. 561,669
Int. Cl.² F05B 65/10; B60R 25/02; F05B 39/04
U.S. Cl. 70—92 33 Claims



1. In an exit lock having a case, a latch bolt actuating member, means supporting said actuating member in said case for movement between first and second positions respectively corresponding to projected and retracted positions of an associated latch bolt, and manually operable first means for moving said actuating member from said first to said second position to enable one lock operating function, the improvement comprising a cassette supported in fixed position in said case and having a housing and a connecting member supported in said housing for movement relative thereto between active and inactive positions, said connecting member having a part thereof exposed externally of said housing for engagement with said actuating member when said connecting member is in its active position, means for releasably securing said cassette in assembly with said case, another member for cooperating with said connecting member in its active position to enable another lock operating function, and manually operable second means for moving said connecting member between its active and inactive positions.

3,981,165

OUTBOARD MOTOR PROPELLER LOCK SYSTEM

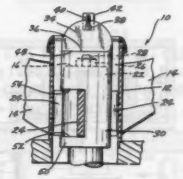
Merol O. Wersinger, 600 Martin Road, Waterloo, Iowa 50701

Filed Mar. 17, 1976, Ser. No. 667,566
Int. Cl.² F16B 21/00
U.S. Cl. 70—232 6 Claims

1. A propeller lock system to be used in combination with a boat motor which has a propeller shaft housing and a concentrically positioned spaced apart outer propeller housing with a plurality of lugs radially extending from said propeller shaft housing to said propeller housing, said lock system comprising;

an inner fin lock adapted for positioning between said propeller shaft housing and said propeller housing, having a top cover portion and a lower lug gripping edge,

an outer fin lock also adapted to position between said propeller shaft housing and said propeller housing, said outer fin lock having a top cover portion and an elongated body portion, said elongated body portion being of sufficient width to nearly completely fill the annular space between two of said lugs, and



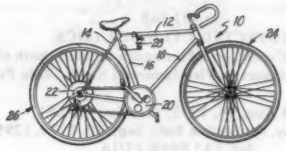
means to lock said inner and outer fin locks together whereby free rotation of said inner fin lock to a position where it can be removed without its inner gripping edge engaging one of said lugs, is prevented.

3,981,166

EASILY ATTACHED BICYCLE LOCKING APPARATUS

Nicholas W. Madonna, P.O. Box 431, Montebello, Calif. 90460

Filed June 16, 1975, Ser. No. 587,203
Int. Cl.² B62H 5/00
U.S. Cl. 70—234 11 Claims



1. A bicycle locking apparatus, comprising:

a housing having top, bottom, front and rear end walls and side walls defining a housing enclosure;

said side walls having upwardly and rearwardly extending portions defining a horizontal channel and a downwardly and forwardly inclined channel respectively for reception of a horizontal bicycle frame part and a forwardly and downwardly inclined bicycle frame part respectively;

means defining a pair of opposite upwardly opening recesses for the upwardly extending portions of the housing, a pair of opposite, rearwardly opening recesses for the rearwardly extending portions of the housing;

said recesses being defined in part by respective locking strips secured to the side walls of the housing, said locking strips having outwardly extending ears with their free edges at the bottom thereof, the ears of the locking strips extending into said recesses.

3,981,167

DIRECT-DIAL COMBINATION LOCK

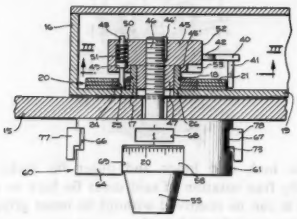
Peter J. Phillips, 828 Calle De Arboles, Redondo Beach, Calif. 90277

Filed Dec. 5, 1974, Ser. No. 529,699
Int. Cl.² E05B 37/04
U.S. Cl. 70—311 8 Claims

1. In a combination lock having a latch operating lever arm movable between latch open and latch closed positions, a plurality of tumbler means for blocking movement of said arm to latch open position until moved into predetermined positions wherein tumbler gate openings are presented toward a part of said arm and a manually operable dial means for locat-

ing said tumbler means through manipulation of a dial portion thereof and for actuating said lever arm after locating of said tumbler means, the improvement comprising the provision of:

a tumbler locator and lever arm actuator member and means for mounting said member for movement about a central axis in response to manual operation of said dial, said member having means for engaging and moving said tumbler means on operation of said dial and a portion



positioned by said mounting means to be normally in relatively movable abutting contact with said lever arm to prevent contact between said arm and said tumbler means during locating of said tumbler means by said member; and

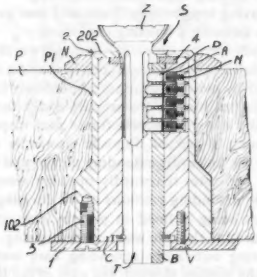
means for selectively adjusting the axial position of said member for sequentially locating and disengaging said tumbler means engaging means from each of said plurality of tumbler means.

3,981,168

PROTECTED CYLINDER LOCK

Giorgio Vanelli Coralli, and Alessandro Brunelli, both of Bologna, Italy, assignors to Viro Innocenti S.p.A., Zola Predosa, Italy

Filed Aug. 18, 1975, Ser. No. 605,681
Claims priority, application Italy, Sept. 10, 1974, 12958/74
Int. Cl.² E05B *15/16*
U.S. Cl. 70—417 **9 Claims**



1. A protected cylinder lock of the type to be mounted on a frame, particularly a door, by securing it to a suitable fastening plate provided at the inner side of the door, comprising:

a. a cylinder lock mechanism of conventional type comprising an outer cylinder and a rotatable plug, the outer cylinder being secured to the fastening plate by means of suitable fasteners;

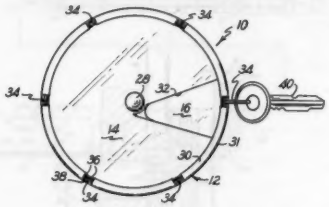
b. a hard material protective casing, fitted onto and encasing the said cylinder lock mechanism, said casing being constructed as a tubular member presenting an open end in correspondence with the extremity of the cylinder lock mechanism directed towards the inside of the door, and a partially closed end in correspondence with the extremity of the cylinder lock mechanism, or external appearing at the outer or external side of the door, said casing being fastened to the said fastening plate by means of suitable fasteners, and presenting a tubular cavity having a transverse section such as to permit the rotation of the outer cylinder of the cylinder lock mechanism encased therein.

3,981,169

KEY HOLDING APPARATUS

James D. Youd, 35 Villa Drive, Foxboro, Mass. 02035

Filed June 6, 1975, Ser. No. 584,694
Int. Cl.² A47G *29/10*
U.S. Cl. 70—456 R **13 Claims**



1. Key case apparatus comprising

a. a generally flat circular base member, a plurality of key recesses formed in the base member and lying in a plane,

b. a cover rotatably mounted on the base member, a key access slot formed in the cover adapted to provide access to a selected key receiving recess upon alignment of the slot with the selected recess, and

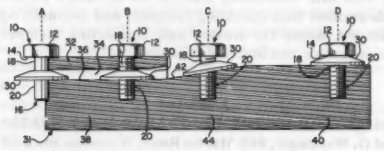
c. key mounting means for each key receiving recess provided on the base member, the key mounting means mounting the keys so that a selected key can be moved out of the plane of the key receiving recess when the key access slot is in alignment with the selected key receiving recess.

3,981,170

APPARATUS FOR ASSEMBLING A SCREW AND COMPRESSIBLE WASHER

Gerald Dean Barth, Elgin, and David Prugh Wagner, Geneva, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 474,502, May 30, 1974, Pat. No. 3,906,567. This application May 8, 1975, Ser. No. 575,757
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.² B21H *3/06*
U.S. Cl. 72—88 **8 Claims**



1. A thread rolling die assembly for fabricating a telescoping screw and compressible washer assembly "which includes an axially compressible washer positioned on a screw blank having an unthreaded shank comprising upper and lower regions and a radially enlarged head", said die assembly comprising a workpiece engageable face with a first longitudinal section having an upper portion with screw blank swaging means, slot means extending inwardly from the workpiece engageable face and located directly beneath the upper blank swaging means, the slot means including a ledge adapted to receive and support said compressible washer on the unthreaded

screw shank while the upper region of the shank is swaged by the upper swaging means, ramp means adapted to move the washer upwardly on the screw shank as the screw-washer assembly moves longitudinally of the workpiece engageable face and, a second longitudinal die section having thread swaging surfaces adapted to deform the lower region of the shank into a helical thread form with a crest diameter greater than the inner diameter of the compressible washer.

3,981,171

TWIN DRIVE FOR ROLLING MILLS

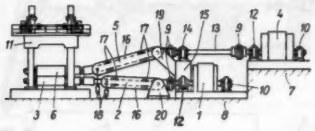
Wolfgang Kmelisch, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 7, 1975, Ser. No. 629,912

Claims priority, application Germany, Nov. 12, 1974, 2454036

Int. Cl.² F16P 7/00

U.S. Cl. 72—249 **5 Claims**



1. In a twin drive rolling mill having upper and lower rollers connected with the rotor shafts of corresponding drive motors through respective transmission chains, an elevated bearing support platform over which the upper-roller transmission chain is guided, each transmission chain including: a coupling that permits longitudinal displacements, a spindle, and an axial pressure bearing for the taking up forces transmitted along the transmission chain; the upper-roller transmission chain further including: an intermediate shaft, a radial bearing mounted on the support platform for accommodating the intermediate shaft, and a support-beam structure arranged laterally of the spindle for supporting the spindle, the improvement comprising: a lever pivotally mounted on the elevated bearing support platform; connection means for connecting said support-beam structure to said lever; and, rupture means connecting said lever to the support platform for rupturing upon the application of a predetermined force between said lever and the support plaform.

3,981,172

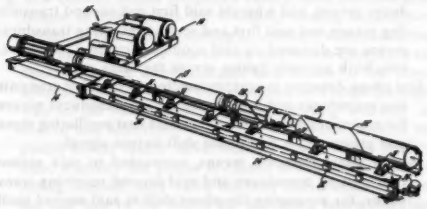
METHOD AND APPARATUS FOR EXPANDING SPIRALLY WELDED PIPE

Johann T. Hess, Deerfield, and Frederick C. Kucklick, Buffalo Grove, both of Ill., assignors to Grotnes Machine Works, Inc., Chicago, Ill.

Filed Sept. 22, 1975, Ser. No. 615,490

Int. Cl.² B21D 41/02, 31/04

U.S. Cl. 72—370 **6 Claims**



1. The method of expanding pipe having a helically welded seam comprising the steps of moving the pipe over an expandable die head assembly adapted to be radially expandable within the pipe and including a helical groove on the surface of the die head, said groove arranged to conform with the helical weld seam of the pipe that is engaged by the die head assembly, expanding said die head assembly within the pipe and progressively advancing the pipe and rotating the same for subsequently incrementally expanding the pipe along its length with the helical weld seam being maintained in substantial conformity with the die head assembly groove.

3,981,173

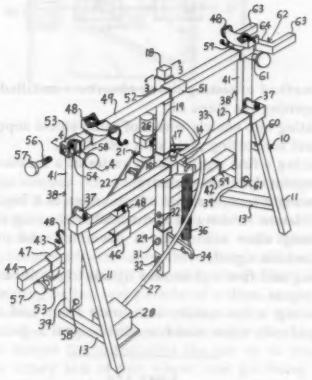
APPARATUS FOR BENDING CONDUITS

Louis C. Nobinger, 1660 Shannon Road, Bessemer, Ala. 35020

Filed Aug. 8, 1975, Ser. No. 603,171

Int. Cl.² B21D 7/06

U.S. Cl. 72—389 **14 Claims**



1. In apparatus for bending conduits with a bending unit embodying a movable bending shoe spaced from conduit engaging members for receiving a conduit therebetween with means to impart relative movement between said bending shoe and said conduit engaging members whereby the conduit is bent,

a. a supporting frame having a generally horizontal guide member,

b. an upstanding member carried by said guide member intermediate the ends of said guide member and adapted for vertical and longitudinal movement relative to said guide member,

c. means pivotally connecting said bending unit to said upstanding member so that the bending unit moves with said upstanding member,

d. means retaining said upstanding member at selected elevations relative to said guide member,

e. an elongated end member mounted for pivotal movement adjacent each end of said guide member and having a depending portion adapted for angular movement to selected positions relative to said guide member, and

f. an elongated conduit supporting member extending between said end members and pivotally connected thereto so that a conduit supported thereby moves to selected elevations in response to angular movement of said end members.

3,981,174

METHOD OF AND DEVICE FOR TESTING THE SHOCK ABSORBERS OF A VEHICLE

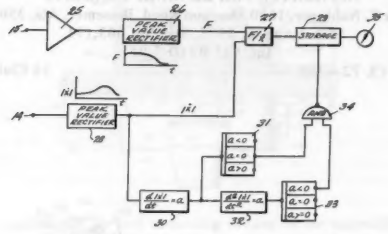
Gunther Himmler, Darmstadt, Germany, assignor to Gebr. Hofmann KG, Darmstadt, Germany

Filed Sept. 19, 1975, Ser. No. 614,957

Claims priority, application Germany, Sept. 23, 1974, 2445406

Int. Cl.² G01M 17/04

U.S. Cl. 73—11 6 Claims



1. A method of testing shock absorbers installed on a vehicle comprising the steps of:

oscillating one vehicle wheel of said vehicle supported on a wheel supporting plate of a test stand,

producing a first signal which varies as a function of wheel footprint dynamic pressure,

producing a second signal which varies as a function of the oscillation velocity of said wheel supporting plate,

detecting when resonance is occurring and producing a resonance signal,

dividing said first and second signals to produce a tire quality signal, and

producing a tire quality indication from said tire quality signal only when said resonance signal is produced.

3,981,175

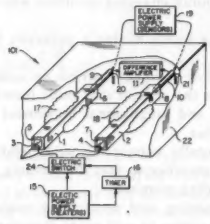
METHOD OF AND APPARATUS FOR NONDESTRUCTIVELY DETERMINING THE COMPOSITION OF AN UNKNOWN MATERIAL SAMPLE

Ogden H. Hammond, III, and Francis I. Baratta, both of Arlington, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 19, 1975, Ser. No. 578,446

Int. Cl.² G01N 25/00

U.S. Cl. 73—15 R 43 Claims



1. Apparatus for determining nondestructively the composition of an unknown sample that comprises, in combination: means for applying heat at a rate q_{su} at one end of an elongate sample of weight W_{su}; means for simultaneously applying heat at a rate q_{st} at one end of a standard of weight W_{st} and having the same length as the length of the sample such that $q_{su}/W_{su} = q_{st}/W_{st}$; first transducer means positioned to sense the temperature at the other end of the sample and to provide a first electric signal; second transducer means positioned to sense the temperature at the other end of the standard and to provide a second electric signal; and means connected to receive and analyze the first electric signal and the second electric signal over time to determine the relative magnitudes, either qualitatively or quantitatively, of the temperatures at the ends of the sample and of the standard.

3,981,176

DUAL FREQUENCY ACOUSTIC GAS COMPOSITION ANALYZER

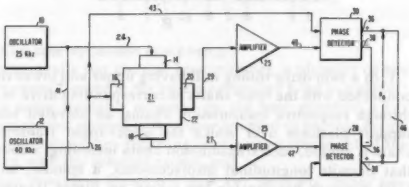
John E. Jacobs, Evanston, Ill., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 16, 1974, Ser. No. 506,744

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² G01N 29/02

U.S. Cl. 73—24 4 Claims



1. An apparatus for measuring the composition of a gas comprising:

a fixed length acoustical column containing the gas to be tested;

first and second variable frequency oscillator means for simultaneously generating respectively first and second different oscillating signals;

first and second transmitting transducer means, disposed on said column, for converting said first and second oscillating signals into mechanical energy;

first and second receiving transducer means disposed on said column for converting the mechanical energy produced by said transmitting transducer means into first and second electrical energy output signals, wherein said first transmitting transducer means is disposed on said acoustical column opposite said first receiving means, and said second transmitting transducer means is disposed on said acoustical column opposite said second receiving transducer means, and wherein said first and second transmitting means and said first and second receiving transducer means are disposed on said acoustical column in order to pass both acoustic beams across the same gap;

first phase detector means, connected to said first transmitting transducer and said first receiving transducer means, for measuring the phase shift in said first oscillating signal and generating a first phase shift output signal;

second phase detector means, connected to said second transmitting transducer and said second receiving transducer, for measuring the phase shift in said second oscillating signal and generating a second phase shift output signal; and

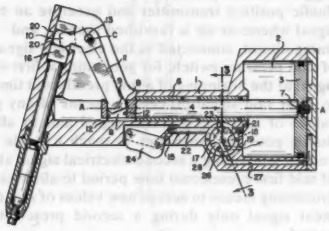
output means, connected to said first and second phase detector means, for summing said first and second phase shifts output signals.

3,981,177

COMPRESSED AIR RIVET SETTING TOOL

Anthony E. Di Maio, and Willem Swier, both of Georgetown, Mass., assignors to Marson Fastener Corporation, Chelsea, Mass.

Filed Feb. 21, 1975, Ser. No. 551,592
Int. Cl.² B21J 15/34
U.S. Cl. 72—391 1 Claim



1. A compressed air-powered blind rivet setting tool comprising

a. a housing with a recess;

b. a piston within the housing for movement by compressed air;

c. a piston rod connected to the piston and supported for reciprocating movement along a straight line within the housing;

d. rivet pulling means reciprocally mounted in said housing and spaced from the piston rod;

e. a pivotable lever member pivoted about a pivot axle on the housing, said lever member having a first cam surface at one end portion which surface is slidable engageable on the pulling means and having a second cam surface at the other end portion slidably engageable with the piston rod so that as the piston rod is moved a distance by the compressed air the rivet pulling means is moved a fraction of that distance, said lever member cam surfaces being shaped so that as the member pivots about the axle the distances between the axle and the lines of contact between the cam surfaces on the one hand and the pulling means and piston rod on the other hand remain constant;

f. compressed air control means including valve means which direct compressed air to cause movement of the piston in one direction for pulling and setting the rivet and cause movement of the piston in the other direction to return the piston; and

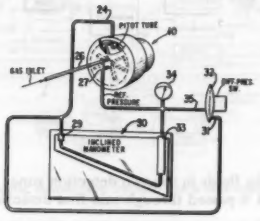
g. said control means includes a rotary valve member positioned in said recess for rotation, closing means connected to said housing having an aperture communicating with the atmosphere and closing said recess except for the aperture which communicates said recess to the atmosphere, chamber means being defined by a single passageway in the valve member communicating with the air source and selectively with first and second sides of the piston as the rotary valve member is rotated in said recess, whereby the piston is caused to move in a reciprocating manner, said valve member communicating with the one side of the piston for providing communication with the air source while permitting the alternate side of the piston to exhaust to atmosphere through said aperture, and for communicating the air source to the alternate side and permitting the one side to exhaust to atmosphere through said aperture.

3,981,178

GAS DENSITY DETECTING APPARATUS

Lloyd R. Jones, Fairfield, Conn., and Frederick W. Roberts, deceased, late of Southport, Conn., by Dorothy A. Roberts, executrix, assignors to Rolock Incorporated, Fairfield, Conn.

Continuation of Ser. No. 298,510, Oct. 18, 1972, abandoned.
This application Apr. 11, 1974, Ser. No. 460,045
Int. Cl.² G01N 9/30
U.S. Cl. 73—30 3 Claims



1. In a gas density detecting apparatus for measuring the density of a gas flowing through a conduit, the combination of a single casing, a rotatable centrifuging wheel located within said casing, said wheel being a hollow disc with a back face and a peripheral wall extending therefrom, said back face having a plurality of radially extending vanes thereon, said vanes terminating before said peripheral wall so as to provide a circumferential space therebetween, means for rotating said wheel, a front face on said hollow disc having central aperture means, inlet means for introducing the gas to be measured adjacent the rotary axis of said wheel, said gas being centrifuged outwardly in said hollow disc toward said peripheral wall and moving with said disc, means adjacent the rotary axis of said wheel for establishing a reference pressure within said casing, means for sensing the relative pressure of the centrifuged gas as compared with said reference pressure, said sensing means including a Pitot tube having its entrance orifice tangentially located adjacent the peripheral wall of said wheel and the ends of said vanes, so that the centrifuged gas provides ram and velocity effect in said Pitot tube, and outlet means thereby providing a gas flow path through said apparatus.

3,981,179

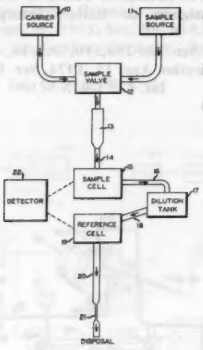
FLUID DETECTING SYSTEM

Lewis B. Roof, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 15, 1975, Ser. No. 622,589
Int. Cl.² G01N 31/08
U.S. Cl. 73—61.1 C 13 Claims

9. A process for the analysis of a fluid stream which is predominately a carrier fluid containing at least one other fluid component in amounts that can be detected by the detector employed in the analysis comprising filling a first detection zone and a second detection zone with said aforementioned carrier fluid containing no amounts of other substances which can be detected by the detector being employed, then passing the fluid to be analyzed through said first detection zone, passing the fluid from said first detection zone to a dilution zone, passing the thus diluted fluid from the dilution zone through said second detection zone, the fluid being diluted with said carrier fluid in said dilution zone until only said

carrier fluid is detectable in said second detector zone by the detector being employed, and comparing at least one characteristic of the fluids in the two detection zones as the fluid to be analyzed is passed through said first detection zone.

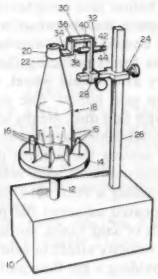


3,981,180

APPARATUS AND METHOD FOR MEASURING CONTAINER LEAN

Sam Lovalenti, Toledo, Ohio, and Darius O. Riggs, Ottawa Lake, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 1, 1975, Ser. No. 573,481
Int. Cl.² G01B *13/04*
U.S. Cl. 73—37.6 **9 Claims**



1. Apparatus for measuring the deviation of the top portion of a glass container from the vertical center line of said glass container which comprises, in combination:

a rotatable turntable;

means for chucking a lower base portion of said glass container on said turntable;

a pivotally mounted follower positioned in contact with the top portion of said glass container;

means for sensing the movement of said follower to maintain contact with said glass container as said glass container is rotated and for generating a displacement signal as a function of said movement, said means for sensing the movement of said follower and for generating a displacement signal as a function thereof including;

a fluidic position transmitter, positioned to impinge a jet of air on the back surface of said follower, said position transmitter generating a back pressure signal as a function of the movement of said follower;

a source of air under pressure connected to said fluidic position transmitter; and

a pressure transducer, responsive to said back pressure signal, for generating an electrical displacement signal proportional to said back pressure signal;

a fluidic toggle switch connected in series between said fluidic position transmitter and said source of air for selectively disconnecting said source of air from said fluidic position transmitter; and

signal processing means, connected to receive said generated displacement signal, for generating an electrical output signal representative of the deviation of the top of said glass container from the vertical center line thereof, said signal processing means including;

a pressure switch, connected to receive air when said toggle switch is positioned to allow air to flow to said fluidic position transmitter and generate an electrical signal whenever air is furnished thereto; and

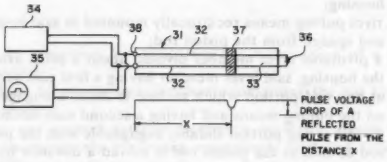
a timing circuit, connected to the electrical signal output of said pressure switch, for generating a first electrical signal at the beginning of a first preselected time period to clear said signal processing means of any previous values of said displacement signal and to allow said fluidic position transmitter to reach a stable position and for generating a second electrical signal at the end of said first preselected time period to allow said signal processing means to accept new values of said displacement signal only during a second preselected time period.

3,981,181

METHOD FOR DETECTING LIQUID LEAK AND A CABLE THEREFOR

Sadamasa Ochiai, 1089-8 Shimofujisawa, Iruma, Saitama, Japan

Filed July 10, 1975, Ser. No. 594,615
Claims priority, application Japan, July 13, 1974, 49-79736
Int. Cl.² G01M *3/16*
U.S. Cl. 73—40.5 R **7 Claims**



1. A method for detecting liquid leaks from holding means for said liquid, which method comprises,

a. laying a cable adjacent said holding means, which cable comprises two electrical conductors held in substantially parallel relationship and insulated from each other by a porous insulating material having continuous pores;

b. sending an electrical pulse wave into one end of said cable, and

c. sensing the pulse shape reflected in said cable, said pulse shape being distorted by liquid leaks in said holding means which leaks alter the characteristic impedance of said cable, thereby enabling the detection and location of said leaks.

3,981,182

FLOW-THROUGH CAPILLARY VISCOMETER

Ivo Kössler, Hradesinska 59, Prague, Czechoslovakia (101 00), and Karel Habr, v Houstce 5/1032, Brandys n.L., Czechoslovakia

Filed July 11, 1975, Ser. No. 596,024
Claims priority, application Czechoslovakia, July 16, 1974, 5072-74
Int. Cl.² G01N *11/06*
U.S. Cl. 73—55 **7 Claims**

1. In a flow-through capillary viscometer comprising an inlet filling tube, an inlet filling bulb, a measuring capillary tube, and a measuring bulb positioned above said measuring

capillary tube; the improvement which comprises providing a filling tube joining the lower part of said inlet filling bulb with

the lower part of said measuring bulb, and wherein said measuring bulb is connected by an air-outlet tube to said inlet filling bulb or an overflow tube.

3,981,183

METHOD AND APPARATUS FOR MEASURING A PHYSICAL PROPERTY OF A FLUID MATERIAL THAT VARIES NONLINEARLY RELATIVE TO THE DENSITY OF THE FLUID

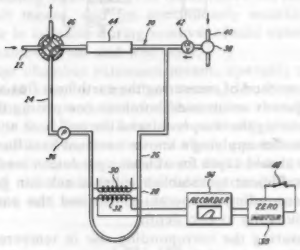
William B. Banks, Chappell Hill, Tex., assignor to Automation Products, Inc., Houston, Tex.

Filed Oct. 3, 1974, Ser. No. 511,909

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² G01N *9/36*

U.S. Cl. 73—61.1 R 13 Claims



1. The method of measuring a physical property of a fluid material that varies nonlinearly relative to the density of the fluid comprising,

measuring the density of the fluid,

injecting a predetermined amount of a second miscible fluid having a density different from the density of the first fluid into a predetermined amount of the first fluid, and

measuring the density of the combined fluids whereby the differences in the two measurements is an indication of the physical property of the first fluid.

3,981,184

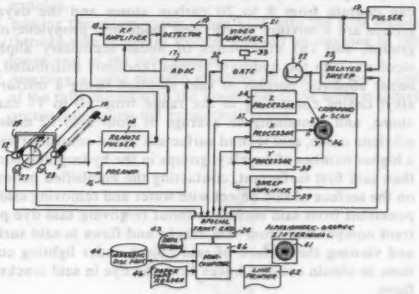
ULTRASONIC DIAGNOSTIC INSPECTION SYSTEMS

Istvan M. Matay, North Royalton, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed May 7, 1975, Ser. No. 575,572

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.8 S 8 Claims



1. An ultrasonic inspection system for a test specimen comprising,

a pulser,

a transducer connected to said pulser for transmitting and receiving ultrasonic energy into and from said specimen,

a receiver connected to said transducer,

angular indexing means producing an output indicative of the angular position of said transducer relative to said specimen,

longitudinal indexing means producing an output indicative of the longitudinal position of said transducer, and

a computing and presentation means receiving the outputs of said receiver,

said angular indexing means and said longitudinal indexing means and producing an output indicative of the internal structure of said test specimen,

wherein said computing and presentation means include a timing means which supplies an input to said pulser, means for changing the angular relationship between said transducer and said test specimen, means for changing the longitudinal relationship between said transducer and said test specimen, an adjustable level gate receiving the output of said receiver and passing echoes above a preset level to said computing and presenting means, and a second transducer mounted adjacent said test specimen on the side opposite said transducer, and an automatic distance amplitude controller receiving the output of said second transducer and supplying an output to said receiver to vary its gain.

3,981,185

POSTEMULSIFIABLE DYE PENETRANT SYSTEM AND METHOD FOR USING SAME

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 444,432, Feb. 21, 1974, Pat. No. 3,915,885, and a continuation-in-part of Ser. No. 444,433, Feb. 21, 1974, Pat. No. 3,915,886. This application Dec. 23, 1974, Ser. No. 535,262

Int. Cl.² G01N *21/16*, *19/08*; C09K *11/06*

U.S. Cl. 73—104 19 Claims

1. A postemulsifieable dye penetrant inspection method for detecting cracks and flaws in the surface of an object, which comprises applying to said surface a biodegradable liquid dye penetrant composition which consists essentially of (1) a first biodegradable nonionic surfactant consisting essentially of an oxyalkylated alcohol, or a mixture thereof, and (2) a small amount of a dye soluble in said first surfactant, said first surfactant having limited water solubility and rendering the dye penetrant difficult to wash away with water, contacting the

dye penetrant covered surface of said object with an emulsifier containing as essential component a second biodegradable nonionic surfactant consisting of an oxyalkylated alcohol, or a mixture thereof, said second surfactant being essentially water soluble, and rendering the emulsified penetrant water washable, said first and second biodegradable nonionic surfactants being of the group consisting of (a) straight chain, primary, aliphatic oxyalkylated alcohols, wherein said alcohols can contain from 8 to 20 carbon atoms and the oxyalkyl groups are a mixture of ethylene oxide and propylene oxide groups, and (b) ethoxylates of linear secondary aliphatic alcohols, with the hydroxyl groups randomly distributed, the linear aliphatic portion of said alcohols being a mixture of alkyl chains containing in the range from 10 to 17 carbon atoms, and containing an average of from 3 to 12 moles of ethylene oxide, said second surfactant in the emulsifier having a higher number of oxyalkyl groups in the hydrophilic portion than said first surfactant, contacting the emulsified penetrant on the surface of said object with water and removing said dye penetrant from said surface without removing said dye penetrant composition from said cracks and flaws in said surface, and viewing the surface of said object under lighting conditions to obtain colored traces from the dye in said cracks and flaws.

3,981,186

DEVICE FOR BLOCKING AT A GIVEN TORQUE A ROTATING MACHINE DRIVEN BY A HYDRAULIC TURBINE

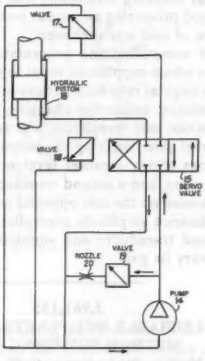
Philippe Rauch, Bosdarros, and Jacques Tinchon, Lescar, both of France, assignors to Teleco Inc., Middletown, Conn.

Filed July 14, 1975, Ser. No. 595,509

Claims priority, application France, July 24, 1974, 74.25618

Int. Cl.² E21B *47/00*

U.S. Cl. 73—151 **5 Claims**



1. A device to block at a predetermined torque value the driven shaft of a rotating machine connected to a driving shaft, including:

a driving shaft;

a driven shaft;

first plate means on said driving shaft having at least three cavities therein equidistantly spaced about said first plate means and penetrating into said first plate means in a first direction;

second plate means on said drive shaft having at least three cavities therein equidistantly spaced about said second plate means and penetrating into said second plate means in a second direction opposed to said first direction of penetration in said first plate means;

at least three rolling bodies between said first and second plate means, each rolling body being located in a homologous manner in a cavity in each of said first and second plate means;

said cavities being grooves that would be made by penetration of one of said rolling bodies into each of said plate means while moving parallel to the axis of the plate means and at a uniform velocity and with each plate means rotating at a uniform velocity and in a direction opposite to the other;

spring means for biasing said second plate means toward said first plate means, said spring means being rotatable with said driven shaft, said second plate means moving away from said first plate means at a predetermined torque load where the axial load on said driven shaft overcomes the biasing load of said spring means; and

brake means for braking said driven shaft at a predetermined torque load, said brake means including at least one disc mounted on said driven shaft for rotation with said driven shaft, and at least one fixed disc facing said mounted disc for frictional engagement with said mounted disc upon movement of said second plate means away from said first plate means, the opposing surfaces of said fixed and mounted discs being of material to retain a substantially uniform friction coefficient regardless of wear.

3,981,187

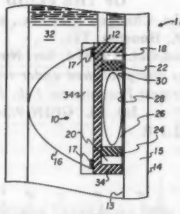
METHOD FOR MEASURING THE THERMAL CONDUCTIVITY OF WELL CASING AND THE LIKE

Eddie P. Howell, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 454,754, March 25, 1974, abandoned. This application July 7, 1975, Ser. No. 593,282

Int. Cl.² E21B *47/06*; G01V *9/00*

U.S. Cl. 73—154 **2 Claims**



1. The method of measuring the earth heat flux at a selected depth adjacent an uncased borehole comprising the steps of:

a. measuring the temperature of the well bore at said depth,

b. thereafter applying a known constant heat flux to the well bore at said depth for at least a predetermined time interval sufficient to establish a linear relation between the corresponding temperature rise and the earth thermal conductivity at said depth,

c. measuring the correponding rise in temperature of the well bore at said depth,

d. measuring the temperature gradient in the unheated well bore between two positions separated therein by a predetermined vertical distance at approximately said depth, and

e. calculating a value for the earth heat flux in the vicinity of said depth as a function of the earth thermal conductivity at said depth and of said temperature gradient, wherein the steps are performed in part by moving past said depths at a constant logging speed a well logging probe carrying a pair of vertically spaced apart temperature sensors responsive to the temperature of said bore hole at their respective levels, means for electrically heating a portion of the probe intermediate said sensors,

and means for decentralizing the probe so that it is urged into thermal conductive contact with said bore hole, the value of said logging speed being equal to or less than the quotient formed by dividing the length of effective heated interface between said heating means and the bore hole by said predetermined time.

3,981,188

METHOD AND APPARATUS FOR TESTING WELLS

Burchus Q. Barrington; David L. Farley, and O. L. Morrisett, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 24, 1974, Ser. No. 517,488
Int. Cl.² E21B *49/00*
U.S. Cl. 73—155 **21 Claims**

21. An apparatus, for sampling high pressure fluid containing underground formations penetrated by a well bore, comprising:

a. conduit means positionable in the well bore for conveying fluids therethrough within the well bore;

b. sampler chamber means, carried by said conduit means, for isolating a sample of the fluids conveyed through said conduit means, and for continuously maintaining said sample in isolation during removal of said extended sample chamber from said well bore;

c. sampler chamber extension means, operably associated with said sampler chamber means, for extending and increasing the volume of said sampler chamber means after the fluid sample is isolated and contained therein in response to upward movement of said conduit means; and

d. motivator means, associated with said conduit means, for causing the fluids from the underground formation to flow into said sampler chamber means.

3,981,189

METHODS AND STEAM SAMPLERS WITH INERTIAL LATCH

Curtis E. Howard, Humble, and Douglas G. Calvin, Houston, both of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 528,073, Nov. 29, 1974, Pat. No. 3,934,469. This application Apr. 14, 1975, Ser. No. 567,787
Int. Cl.² E21B *47/00*
U.S. Cl. 73—155 **10 Claims**

1. A method for collecting a sample of steam at any desired location down in a well having free passage for a cylindrical collecting vessel suspended on a wire line therein comprising the steps of,

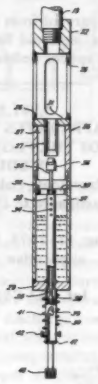
a. passing the steam that has arrived at the desired location through a tube means internally of the cylindrical collecting vessel,

b. passing a portion of the steam vapor phase and liquid phase from the tube means through an upper opening in the tube means out into an annulus formed between the tube means, and the cylindrical collecting vessel,

c. collecting the steam liquid phase and vapor phase in the annulus,

d. passing the steam vapor phase back into the tube means through side openings therein and out an opening in the lower end of the tube means,

e. inserting a solid massive mandrel up into the lower end of the tube means with the lower end of the solid mandrel protruding below the cylindrical vessel,



f. latching the solid massive mandrel to the wire line supported vessel in a lowered and liquid unsealing position with an inertial operated spring latch,

g. lowering the cable and vessel rapidly for a predetermined distance,

h. unlatching the solid massive mandrel from the vessel by sudden deceleration of the wire line and vessel,

i. raising the solid mandrel relative to the tube means to latch the solid massive mandrel in raised liquid sealed position wherein the openings are sealed closed by inertial forces and spring action of the latch to accordingly seal any steam liquid phase in the annulus,

j. raising the cylindrical vessel to the surface, and

k. cooling the cylindrical vessel for removal of the steam liquid phase.

3,981,190

ELECTROMAGNETIC FLOWMETER HAVING INTERNAL FIELD COILS

Eugene Vidmantas, Greece, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed May 23, 1975, Ser. No. 580,281
Int. Cl.² G01F *1/58*
U.S. Cl. 73—194 EM **10 Claims**

6. A flowmeter having, in combination:

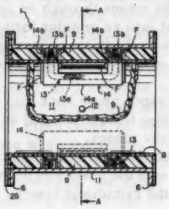
a. a flow tube having a bore providing for flow of a conductive fluid through said flowmeter;

b. field coil means in said bore for producing a magnetic field therein transverse to the flow of said fluid;

c. measuring means for sensing and conditioning voltages induced in said fluid by its said flow through said flow tube;

d. said flow tube having a magnetic pipe section, non-magnetic box means projecting inwardly into said bore, said

box means defining spaces having substantially the shape and proportions of said field coil means, said spaces being located below the exterior surface of said tube but being



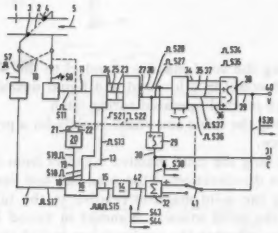
hermetically separated from the bore of said flow tube by said box means, and said field coil means being fixedly secured in said spaces defined by said box means.

3,981,191

METHOD AND APPARATUS FOR THE ULTRASONIC MEASUREMENT OF THE FLOW VELOCITY OF FLUENT MEDIA

Alvin E. Brown, Claremont, Calif., and Niels Thun, Sonderborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Aug. 11, 1975, Ser. No. 603,294
Claims priority, application Germany, July 5, 1975, 2530202
Int. Cl.² G01F 1/66
U.S. Cl. 73—194 A **20 Claims**



1. In apparatus for the measurement of fluid flow rate using ultrasonic signals, said apparatus having first and second transducers positioned in relative upstream and downstream locations in communication with the fluid to be measured for alternately transmitting said ultrasonic signals in opposite senses therebetween, the combination comprising:

a timing generator for controlling the transmission times of said ultrasonic signals and generating a reference signal delayed with respect to each said transmission time,

comparator means for generating early and late signals according to whether the received ultrasonic signals are early or late relative to each said reference signal,

a first signal level generator responsive to at least some of said early and late signals for generating a first signal level related to sound speed in said fluid,

logic means responsive to said comparator means and to the sense of transmission of said ultrasonic signals for generating early and late signals correlated with transmission direction upstream and downstream,

a second signal level generator responsive to at least two of said early and late signals correlated with transmission direction for generating a second signal level different than said first level related to said fluid flow rate, and

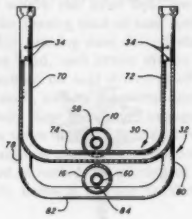
adder means responsive to said first and second signal levels for generating control signals related respectively to the upstream and downstream speeds of sound for controlling the timing of said timing generator.

3,981,192

FLUID PRESSURE SENSING APPARATUS

Carl J. Bauder, Syracuse, N.Y., assignor to Cambridge Filter Corporation, Syracuse, N.Y.

Filed May 23, 1975, Ser. No. 580,152
Int. Cl.² G01F 1/46
U.S. Cl. 73—212 **9 Claims**



1. Means for communicating the pressure of a field within an enclosed space to a measuring instrument, said means comprising, in combination:

a. a hollow, U-shaped sensing probe having first openings in both legs through which the interior of the enclosed space communicates with the interior of each leg of said probe;

b. a hollow manifold tube of substantially larger internal cross section than said probe and having a second opening through a wall thereof;

c. means fixedly connecting and effecting an air-tight seal between said probe, substantially at the mid-point between the legs thereof, and said manifold tube about the periphery of said second opening;

d. said probe having a third opening through which the interior of each of said legs communicates with the interior of said manifold tube;

e. a pressure measuring device; and

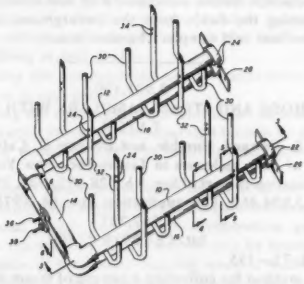
f. means communicating the pressure within said manifold tube to said device.

3,981,193

FLUID PRESSURE SENSING APPARATUS

Roger T. Goulet, 7952 Orion Path, Liverpool, N.Y. 13088

Filed May 23, 1975, Ser. No. 580,153
Int. Cl.² G01F 1/46
U.S. Cl. 73—212 **7 Claims**



1. Apparatus for measuring the pressure within an enclosed

duct having fluid flowing in a first direction therethrough, said apparatus comprising, in combination:

a. at least one hollow manifold tube extending laterally across the duct and having an effective internal cross sectional area, constant along its entire length, of a first predetermined value, and a length of a second predetermined value;

b. a plurality of hollow, U-shaped sensing tubes arranged at spaced intervals along the length of said manifold tube, each of said sensing tubes having open ends directed oppositely to the direction of fluid flow;

c. each of said sensing tubes having an opening located substantially at the mid-point between said open ends and having an area of a third predetermined value;

d. means fixedly connecting and effecting an air-tight seal between each of said sensing tubes, substantially at the mid-points thereof, and said manifold tube for communication of the interiors thereof through said sensing tube openings;

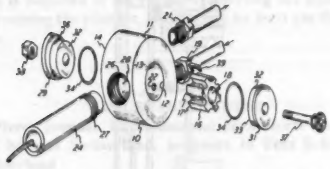
e. the ratio of said first and second values being sufficiently large with respect to said third value, to reduce the velocity of air flow within said manifold to an extent eliminating any appreciable pressure drop along the length of said manifold tube; and

f. means for communicating the pressure within said manifold tube to a point outside the duct.

3,981,194
FLOW METER SYSTEM

Bernard G. Blise, and Norman H. Jessen, both of Kenosha, Wis., assignors to William O. Lehman, Kenosha, Wis., a part interest

Filed Aug. 21, 1975, Ser. No. 606,463
Int. Cl.² G01F *1/075*
U.S. Cl. 73—229 **5 Claims**

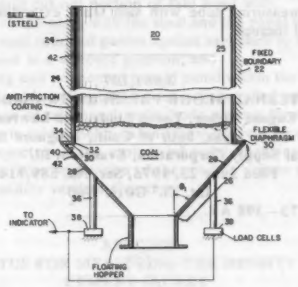


1. A flow meter system comprising a housing having a fluid inlet and a fluid outlet and a circular chamber in flow communication with said inlet and said outlet, a cylindrically-shaped rotor rotatably disposed in said chamber and being capable of rotation in response to the flow of fluid through said housing and with said rotor having a plurality of openings spaced around the circumference thereof and having vanes projecting radially between said openings and having an axial opening extending therethrough, said housing and said rotor being non-metalic, end covers on said housing, and a bolt of a diameter having clearance with said rotor axial opening and extending into said housing and loosely through said rotor axial opening for securing said end covers fluid-tightly to said housing, a metalic piece attached to one of said vanes of said rotor and being disposed at the periphery thereof, a radio frequency sensor mounted on said housing and extending to a location adjacent said chamber for sensing the passing of said metalic piece during rotation of said rotor in the disturbance of the radio wave emitted by said sensor, and a counter connected with said sensor for recording the wave disturbances and thus the revolutions of said rotor to thereby determine the flow of fluid through said housing.

3,981,195
SILO LEVEL MEASURING SYSTEM

Ross H. Forney, Renner, and Candelario Paredes, Dallas, both of Tex., assignors to Forney Engineering Company, Carrollton, Tex.

Filed July 21, 1975, Ser. No. 597,936
Int. Cl.² G01F *23/20*
U.S. Cl. 73—296 **19 Claims**

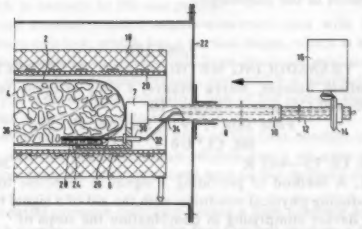


1. A system for measuring levels of bulk material in a silo comprising: an upper storage compartment, means for supporting said upper storage compartment, a lower hopper discharge compartment connected to said upper storage compartment, said upper storage compartment and said hopper discharge compartment selectively formed with marginal edges which are spaced apart and operatively engage each other, such that said hopper discharge compartment supports the load of said bulk material without being effected by the weight of said upper storage compartment, and means responsively coupled to said hopper discharge compartment for measuring the load thereof.

3,981,196
APPARATUS FOR TEMPERATURE MEASUREMENT

Klaus Zeuch, Eckental, and Josef Stadter, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 24, 1975, Ser. No. 561,342
Claims priority, application Germany, Mar. 27, 1974, 2414888
Int. Cl.² F27D *21/00*; G01K *1/14*
U.S. Cl. 73—343 B **5 Claims**



1. Apparatus for the temperature measurement of a granular semiconductor material which is evaporated in an ampoule supported along an axis of symmetry having two closed end walls arranged in an autoclave with the counter pressure of the autoclave controlled as a function of the vapor pressure of the semiconductor material, in particular in such apparatus for the production of a semiconductor compound, one component of which possesses a significantly higher vapor pressure

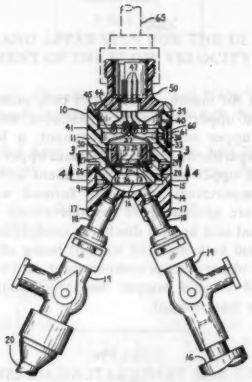
than the other or others, comprising: a measuring tube with a diameter much smaller than that of the ampoule inserted through and sealed into one of said end walls of the ampoule eccentric to said axis of the ampoule near its bottom so that its closed end is located in and surrounded by the granular semiconductor material being evaporated therein and with its open end at the outside surface of the wall of said ampoule so as to permit insertion of a temperature sensor therein; and a temperature sensor having leads inserted into the closed end of said measuring tube with said leads extending from the open end thereof.

3,981,197

EXTERNAL BLOOD PRESSURE TRANSDUCER

Clement Eugene Lieber, Yorba Linda, and Lawrence Webster Blake, Costa Mesa, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed June 23, 1975, Ser. No. 589,714
Int. Cl.² G01L 9/06
U.S. Cl. 73—398 AR **11 Claims**



1. In a fluid pressure transducer, a flexible diaphragm of elastomeric material, a strain gage beam element encapsulated in said elastomeric material, and electrical connections for said beam element encapsulated in said elastomeric material, said diaphragm comprising a pair of discs of said elastomeric material bonded together with said beam element disposed between said discs, at least one of said discs being transparent to provide inspection of the position of said beam element in the diaphragm.

3,981,198

TRANSDUCING METHODS AND TRANSDUCERS

Winfield Sample, Sierra Madre, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed July 7, 1975, Ser. No. 593,395
Int. Cl.² G01L 7/08, 9/04
U.S. Cl. 73—407 R **30 Claims**

1. A method of providing a signal in response to a force producing physical condition with the aid of a signal transducing device comprising in combination the steps of:

providing a laterally flexible tubular enclosure having two opposite ends;

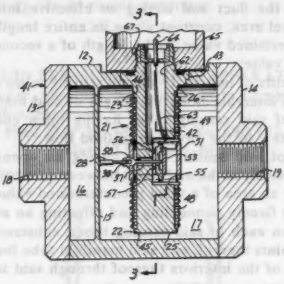
locating said signal transducing device inside said tubular enclosure;

maintaining both of said ends relatively stationary;

picking up said force outside said tubular enclosure;

applying said picked-up force to said tubular enclosure between said relatively stationary ends and laterally flexing said tubular enclosure with said applied force between said relatively stationary ends;

maintaining said signal transducing device stationary relative to said flexing tubular enclosure; and



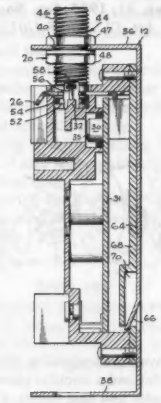
transmitting said applied force to said relatively stationary signal transducing device to generate said signal inside and during the flexing of said tubular enclosure.

3,981,199

PRESSURE TRANSDUCER

Leonard W. Moore; Ronald L. Bodle, both of Northridge, and Conrad Fiederer, Agoura, all of Calif., assignors to Moore Industries, Sepulvada, Calif.

Filed Aug. 29, 1975, Ser. No. 608,889
Int. Cl.² G01L 7/00
U.S. Cl. 73—420 **36 Claims**



5. A quick connect-disconnect connector for a pressure transducer comprising a tubular coupling adapted to be connected to a pressurized line, a pressure transducer housing, said pressure transducer housing having a tubular coupling receiving bore formed therein and sized to receive said tubular coupling, said pressure transducer housing having a chamber formed therein communicating with said tubular coupling receiving bore, a pressure transducer mounted in said chamber so it is responsive to the pressure in said chamber, means for releasably connecting the chamber in the pressure transducer housing to the tubular coupling, and valve means in the tubular coupling to automatically close said tubular coupling when the pressure transducer housing is separated from the tubular coupling and to automatically open the tubular coupling when the pressure transducer housing is connected to it so pressure can enter into said bore to cause the pressure transducer to provide a signal functionally related to said pressure.

3,981,200

METHOD OF AUTOMATICALLY TRANSFERRING AND INJECTING A LIQUID SAMPLE

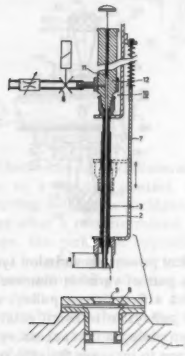
Richard Alexander George, and Adriaan Herman Hubert van Abel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1975, Ser. No. 609,012

Claims priority, application Netherlands, Sept. 2, 1974, 7411605

Int. Cl.² G01N 1/10

U.S. Cl. 73—422 GC 4 Claims



1. A method for transferring and injecting a liquid sample into a receiver with the aid of an injection syringe having a plunger and a needle, comprising the sequential steps of drawing a liquid sample into the syringe by withdrawing the plunger, moving the syringe relative to the receiver so that the needle is disposed in the receiver, injecting the liquid sample by depressing the plunger, and passing an inert gas through the needle.

3,981,201

ADJUSTABLE METER

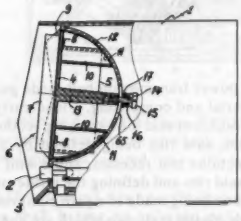
Jean-Pierre Jeannet, Lausanne, and Jean-Pierre Leuba, Renens, both of Switzerland, assignors to Tesa S.A., Renens, Switzerland

Filed Jan. 10, 1975, Ser. No. 540,134

Claims priority, application Switzerland, Feb. 15, 1974, 2130/74

Int. Cl.² G01D 11/24

U.S. Cl. 73—431 5 Claims



1. An adjustable meter comprising:

a. a casing formed to be part of a stack of apparatus, said casing having a front wall with a cut-out portion formed in the surface thereof;

b. at least one shell disposed within said casing, said shell extending from the inner face of the front wall of said casing;

c. a panel located in said cut-out portion of said front wall, said panel having an opening formed therein and a plurality of projections fixed on its rear face, the ends of said projections shaped to form rounded guides bearing and sliding against said shell to allow swinging movement of said panel about a horizontal and/or vertical direction within said cut-out portion of said front wall;

d. means cooperating with the shell and the panel for maintaining said rounded guides against said shell to maintain said panel in a selected position; and

e. a reading unit connected to said panel within the opening thereof, said reading unit having a dial applied against the front face of said panel and a body passing through said opening in said panel to extend from the rear face thereof and project into the casing, whereby swinging of said panel permits orientation of the reading unit in the horizontal and/or vertical direction.

3,981,202

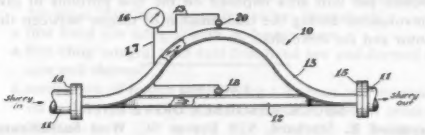
APPARATUS FOR MEASURING THE DENSITY OF A CEMENT SLURRY

Lloyd B. Spangle, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 2, 1975, Ser. No. 537,872

Int. Cl.² G01N 9/26

U.S. Cl. 73—438 1 Claim



1. Apparatus for measuring the density of a cement slurry stream, which includes the combination of:

a delivery conduit which is adapted for carrying the cement slurry stream under a positive pressure from a holding point to a use point, the delivery conduit being connected at one end to the holding point and at the other end to the use point;

a first conduit section which communicates with the delivery conduit, which has a curved shape, which is in a horizontal position, and which is adapted to carry in a horizontal curved path a part of the cement slurry stream which is enroute to the use point;

a second conduit section which communicates with the delivery conduit, which has a curved shape, which is in a vertical position located at 90° from the horizontal position of the first conduit section, and which is adapted to carry in a vertical curved path a part of the cement slurry stream which is enroute to the use point;

the combined cross-sectional area of the first conduit section and the second conduit section being an area not greater than the cross-sectional area of the delivery conduit;

a differential pressure indicator having a high pressure area which communicates with the first conduit section, a low pressure area which communicates with the second conduit section, and a scale which reads in units of density, wherein

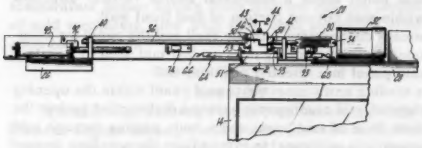
the said pressure indicator will sense a pressure difference between the part of the slurry stream flowing through the first conduit section and the part of the slurry stream flowing through the second conduit section, and will read the said pressure difference on the indicator scale as units of density.

3,981,203

DOOR OPERATOR

Gardner R. Williams, Kensington, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Oct. 24, 1974, Ser. No. 517,734
Int. Cl.² F16H 21/50
U.S. Cl. 74—25 3 Claims



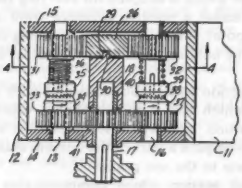
1. A door operator suited for powering a traffic responsive sliding door suspended by a trolley which rides on a track mounted by a header above the doorway comprising a threadless drive shaft, journal means mounting said shaft for rotation and limited reciprocation in parallel relationship to the track, a reversible drive motor having a shaft coaxially aligned with the drive shaft, a reciprocable carriage mounting rollers engaging the drive shaft, said rollers being skewed relative to the axis of the drive shaft to move the carriage along the shaft as the shaft is rotated, and a coupling having a midsection comprising a plurality of closely spaced helical convolutions with the end portions thereof respectively secured to said motor shaft and said drive shaft, and means for decreasing the shear stresses per unit area imposed on the end portions of said convolutions during the transmission of torque between the motor and the drive shaft.

3,981,204

SHOCK ABSORBER DRIVE UNIT

Raymond E. Starbard, 929 Drever St., West Sacramento, Calif. 95691

Filed Jan. 6, 1975, Ser. No. 539,028
Int. Cl.² F16H 21/52
U.S. Cl. 74—34 1 Claim



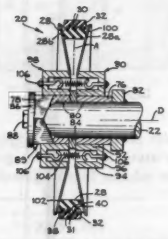
1. A shock absorber power system for motor vehicles of the type supported on four wheels and including a frame comprising a plurality of units secured to the frame adjacent each wheel of the motor vehicle with each of said units including a housing, a rack bar mounted for vertical sliding movement vertically through said housing, said rack bar having rack teeth formed on diametrically opposed sides thereof, means in said housing guiding said rack bar in its vertical reciprocation, a pair of parallel shafts journalled in said housing on opposite sides of said rack bar, a gear secured to each of said shafts and meshing with the rack teeth on opposite sides of said rack bar, a one-way clutch mounted on each of said shafts, a spur gear mounted for rotation on each of said shafts rotatably driven by one of said one-way clutches, a third shaft journalled in said housing and extending outwardly therefrom, a spur gear secured to said third shaft and meshing with the gears on said parallel shafts, a base supporting said housing, a gear train mounted on said last named shaft and said base, a pair of electric alternators secured to said base, and means extending from said gear train for rotating said alternators to produce electricity.

3,981,205

DUAL RANGE INFINITELY VARIABLE SPEED DRIVE

Stellios A. Avramidis, Greenfield, and William T. Partridge, Indianapolis, both of Ind., assignors to FMC Corporation, San Jose, Calif.

Filed July 5, 1974, Ser. No. 486,261
Int. Cl.² F16H 55/56, 9/00, 9/16
U.S. Cl. 74—230.17 A 8 Claims



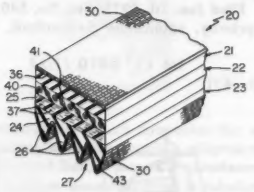
1. In a mechanical power transmission system, the combination comprising a pair of variable diameter pulleys including a drive pulley and a first driven pulley, a first endless belt trained over said pulleys to transmit rotation from the drive pulley to the driven pulley, a first accessory driven by said first driven pulley, means to increase the effective diameter of one of said pulleys and simultaneously decrease the effective diameter of the other of said pulleys in response to the speed of at least one of said pulleys, a second endless belt received on top of said first endless belt in at least one of said pulleys, a second driven pulley to receive said second belt, and a second accessory driven by said second driven pulley.

3,981,206

ENDLESS POWER TRANSMISSION BELT

Joseph P. Miranti, Jr., Nixa, and Carl R. Woodland, Springfield, both of Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Aug. 20, 1975, Ser. No. 606,153
Int. Cl.² F16G 5/16, 1/22
U.S. Cl. 74—233 19 Claims



1. An endless power transmission belt made primarily of an elastomeric material and comprising, a load-carrying section, a ribbed section adjacent said load-carrying section defined by a plurality of ribs, said ribs being defined by a plurality of alternating projections and recesses, and a knit cover fabric bonded against said ribs and defining the inside surface of said belt, said knit fabric being made of a yarn comprised of at least a pair of synthetic plastic materials which are bonded together on an interface having exposed edges, said knit fabric affording extensibility in a plurality of directions to assure said belt is particularly adapted to be operated in associated sheaves with minimum stresses being imposed thereon due to said cover fabric.

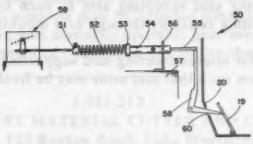
3,981,207
MOTOR VEHICLE THROTTLE CONTROL

Ivan H. Stant, 2103 Indiana Ave., and Arville E. Bertsch, R.R. No. 1, both of Connersville, Ind. 47331

Continuation-in-part of Ser. No. 469,964, May 13, 1974, abandoned. This application June 20, 1975, Ser. No. 588,774

Int. Cl.² G05G 1/14

U.S. Cl. 74—513 5 Claims



1. In a motor vehicle having an accelerator pedal coupled through a linkage to a throttle control, the improvement which comprises spring means for yieldably opposing movement of the linkage after a predetermined amount of movement of the linkage, the yieldable opposition of the spring means being applied between the motor vehicle and the linkage, the spring means comprising a spring, coupled at a first end to the linkage and at a second end to a first stop member, and a second stop member attached to the motor vehicle and positioned to engage the first stop member afer said predetermined movement of the linkage.

3,981,208
SHEET WINCH

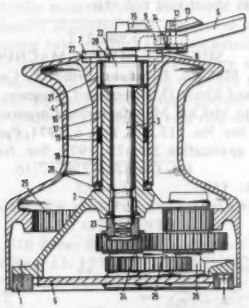
Andrianus Moses, Voorschoten, Netherlands, assignor to Enkes N.V., Voorburg, Netherlands

Filed Oct. 15, 1974, Ser. No. 514,507

Claims priority, application Netherlands, May 29, 1974, 7407198

Int. Cl.² F16H 5/52

U.S. Cl. 74—812 7 Claims



6. A sheet winch as defined in claim 1 further comprising:

said base member including an upwardly extending column having an upper end located below the upper end of the winch;

the drive shaft extending downwardly through said column, said drive shaft having an enlarged collar formed at its upper end above the upper end of the column;

the winch drum having a downwardly extending sleeve which circumscribes the column and the enlarged collar of the shaft; and

bearing means interposed between the drum sleeve and each of the column and collar.

3,981,209
GRIPPING PINCERS

Yves Robert Caroff, Saint-Mande, France, assignor to Facom, Morganis, France

Filed July 10, 1974, Ser. No. 487,044

Claims priority, application France, July 20, 1973, 73.26805

Int. Cl.² B25B 7/12

U.S. Cl. 81—367 4 Claims

1. A gripping pincers of the vice-pincers type, the pincers comprising:

a main lever of forged steel having a milled fork, the milled fork including an elongated opening on both sides thereof having a plurality of arcuate notches therealong,

a first fixed jaw integral with said main lever,

a first chop integral with said first fixed jaw and formed at one end thereof,

a second jaw of forged steel having a T shape and mounted on a first part of said main lever for pivotal motion thereon,

a journal mounted on the base portion of the T shaped second jaw, wherein said journal is capable of engaging a selected one of said arcuate notches for pivotal motion thereon and whereby the transverse distance between the first and second jaw may be adjusted,

a second chop mounted on a first cross arm bar of said T shaped second jaw,

a toggle device connecting said pivotable jaw to another part of said main lever, the toggle device comprising an auxiliary lever of forged steel pivoted to the second cross arm bar of said T shaped second jaw wherein the journal of said second jaw and the elongated opening of the fork is between the second chop and the pivot of said second cross arm in all relative positions of said first and second jaws, the toggle device performing the function of a lever for locking the pincers,

an adjustable lever of changeable length having one end pivoted to a forked lug integral with said auxiliary lever and another end pivoted to a forked lug integral with said main lever, said adjustable lever comprising an elongated tubular element having at either end a set of internal threads, the threads of one set being pitched oppositely to the threads of the other, a first threaded rod attached at one end thereof by a pivot to the forked lug of said main lever and engaging at the other end thereof by means of threads one set of the internal threads of said tubular element, and a second threaded rod attached at one end thereof by a pivot to the forked lug of said auxiliary lever and engaging at the other end thereof by means of threads the other set of internal threads of said tubular element, whereby rotation of the tubular element relative to the first and second threaded rods causes a change of length of the adjustable lever,

a fixed abutment integrally formed on said auxiliary lever, said abutment contacting the tubular portion of the adjustable lever whereby the approach of the auxiliary lever toward the main lever is limited.

a stressed spring, a projection integral with said second jaw adjacent to said journal, and a pin mounted on said main lever between said elongated opening and the forked lug of said main lever, wherein said stressed spring is attached to said projection and said pin and whereby said spring urges said journal into engagement with a selected one of said notches and biases said two jaws into an opened position, and

a transverse aperture located in said main lever and adapted to receive a lever perpendicular to said main lever for applying a driving torque to the pincers.

3,981,210

GUIDE MEANS FOR BORING BARS

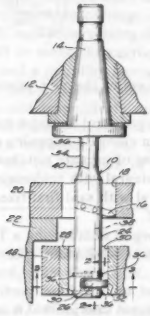
Kasimir Janiszewski, 11908 W. Loomis Road, Franklin, Wis. 53132

Filed Sept. 12, 1974, Ser. No. 505,393

The portion of the term of this patent subsequent to Mar. 5, 1991, has been disclaimed.

Int. Cl.[2] B23B *41/06*

U.S. Cl. 82—1.4 **6 Claims**



1. In apparatus for boring holes including a rotatable and longitudinally movable boring bar having a radially projecting tool for engaging and removing material from a bore in a workpiece and having a free end that extends beyond said tool and having guide means to guide said tool, the improvement wherein said guide means comprises a guide bushing separate from the workpiece and having an axis supported in generally coaxial alignment with said boring bar around the free end thereof, and a guide roller rotatably attached adjacent the free end of said boring bar for rotation about an axis parallel to and eccentric with respect to the axis of rotation of said bar and for longitudinal movement with said boring bar and within said guide bushing and rollably engaged with the interior surface of said guide bushing at a point located generally in the same axial plane and the same radial direction as said projecting tool with said contact point shifting longitudinally along said interior surface of said guide bushing as said boring bar moves through the workpiece to form a surface in the workpiece complementary in shape to the surface of the guide bushing.

3,981,211

SELF-CENTERING TOOL HOLDING APPARATUS

Clarence A. Turner, 2028 Floral Ave., Charlotte, N.C. 28203

Filed June 13, 1975, Ser. No. 586,554

Int. Cl.[2] B23B *29/04*

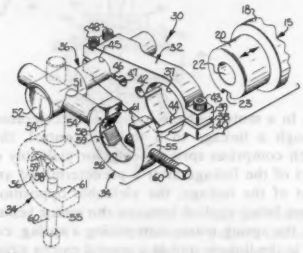
U.S. Cl. 82—36 R **9 Claims**

1. An apparatus for releasably holding a tool within the socket in a tailstock spindle of a lathe or the like to thereby prevent relative rotation between the tool and spindle, and characterized by the ability to be automatically centered about the axis of the tool so that no lateral stresses are applied to the tool by the apparatus, said apparatus comprising

a supporting arm having a transverse opening defining a first axis and which is adapted to coaxially receive the tailstock spindle of a lathe or the like therethrough, and means for releasably securing said supporting arm to such spindle with the spindle extending coaxially through said opening,

a mounting arm having a transverse opening defining a second axis and which is adapted to coaxially receive a tool or the like therethrough, and means for releasably securing said mounting arm to such tool with the tool extending coaxially through said mounting arm opening, and

means for interconnecting said supporting arm and mounting arm such that said arms may be freely moved relative



to each other in parallel planes with said first and second axes extending parallel to each other to thereby permit the axes to move into coaxial alignment, while precluding relative rotation of said arms about said first and second axes, said interconnecting means comprising a cylindrical rod defining a rod axis, means for mounting said rod to one of said supporting arm and mounting arm such that the rod extends parallel to the associated opening axis and while permitting relative linear movement along a direction perpendicular to said rod axis, and means for mounting said rod to the other of said supporting arm and mounting arm such that the rod extends parallel to the associated opening axis and while permitting relative rotation about said rod axis.

3,981,212

SHEET TRIMMING MACHINE

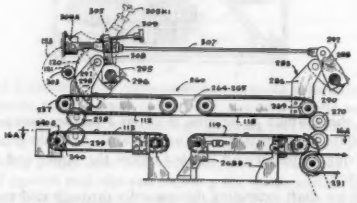
William B. McCain, Hinsdale; James F. Cosgrove, Western Springs, and Elmer D. Bewersdorf, Downers Grove, all of Ill. Assignor to McCain Manufacturing Corporation, Chicago, Ill.

Division of Ser. No. 115,174, Feb. 6, 1971, Pat. No. 3,732,766.

This application Jan. 29, 1973, Ser. No. 327,488

Int. Cl. B26d *7/06, 7/16*

U.S. Cl. 83—155 **5 Claims**



1. In a machine for trimming stacked sheets such as signatures or the like fed through the machine in sets of stacks one after another to be trimmed first at one knife station and then at a second knife station, and in which the dimensions of the stacks including height may vary from one machine run to the next: feed means including a set of opposed, vertically spaced

feed bands for advancing a stack of trimmed sheets from the first knife station toward the second knife station, other feed means including a set of opposed vertically spaced feed bands for clearing a stack of trimmed sheets from the second knife station, individual supports for the upper feed bands in the two sets of feed bands, each of said individual supports having a rotary shaft rotation of which is accompanied by raising or lowering of the related support, means joining the shafts so that an increment of rotation in one shaft is accompanied by a substantially equal increment of rotation in the other shaft whereby the two supports may be adjusted simultaneously by an equal amount, and manually operable gear means for imparting an increment of rotation to one of the shafts.

3,981,213

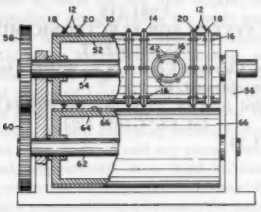
ROTARY SHEET MATERIAL CUTTER AND CREASER

Albert Lopman, 123 Dayton Road, Lake Worth, Fla. 33463

Filed Oct. 25, 1974, Ser. No. 518,078

Int. Cl.² B23D *25/12*; B26D *1/56*

U.S. Cl. 83—346 **11 Claims**



1. A rotary cutting and creasing apparatus for the continuous cutting and creasing of forms (34) from rolls (70) of sheet material (68) of paper, cardboard, corrugated paper or like rolls comprising a die sleeve (10), a die sleeve supporting base cylinder (52), an anvil sleeve (66), an anvil sleeve supporting base cylinder (64), each base cylinder (52, 64) having a bearing shaft (54, 62) extending axially therethrough and through a bearing framework (56), means (58, 60) gearing said shafts (54, 62) together for simultaneous rotation, said anvil sleeve (66) being of ductile material, said die sleeve (10) being of comparatively harder material, said die sleeve (10) having cutting and creasing rule means (12) delineated thereon in desired patterns, said rule means (12) being substantially triangular in cross-section, and spaced opposed fingers (16) struck up from said die sleeve embracing opposite lateral sides (14) of said rule means (12) securing said rule means (12) to said die sleeve (10).

3,981,214

CODE KEY CUTTER HAVING INTERCHANGEABLE ATTACHMENTS

Horst W. Wich, 816 Brent St., South Pasadena, Calif. 91030

Filed Nov. 13, 1975, Ser. No. 631,502

Int. Cl.² B26F *1/12*

U.S. Cl. 83—414 **12 Claims**

1. A key cutting machine comprising:

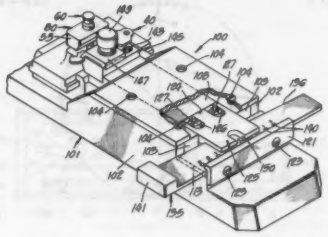
a key carriage adapted to support a key blank thereon with the operative edge of the key blank projecting beyond the carriage;

a die carriage having a die and a punch supported thereon, said punch being reciprocable within said die;

means supporting said key carriage juxtaposition to said die carriage so that the operative edge of the key blank may be interposed between said punch and said die;

means for adjusting the position of said die carriage relative to said key carriage in a direction longitudinally of the key blank, so as to select a longitudinal position on the key blank at which end a notch is to be cut;

means for adjusting the position of said key carriage relative to said die carriage in a direction perpendicular to the operative edge of the key blank in order to set the depth of the notch that is to be cut, said key carriage adjusting means including a cam which is coupled to said key carriage and extends generally parallel to the longitudinal



axis of the key blank but at an acute angle relative thereto, and drive means cooperable with said cam for driving said key carriage either towards or away from said key carriage; and

means manually operable after both of said carriages have been positioned for driving said punch into said die to cut the notch.

3,981,215

APPARATUS FOR CUTTING SHEET MATERIAL

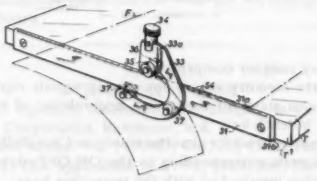
Maurice Granger, 28 rue Charles de Gaulle, 42000 Saint-Etienne, Loire; Andre Lerond, 174 rue Leon Blum, 69100 Villeurbanne, Rhone, and Olivier Faillliot, Rochefort en Yvelines, Yvelines, all of France

Filed Oct. 9, 1974, Ser. No. 513,495

Claims priority, application France, Oct. 12, 1973, 73.37147; Feb. 12, 1974, 74.05637

Int. Cl.² B26D *1/20*

U.S. Cl. 83—455 **15 Claims**

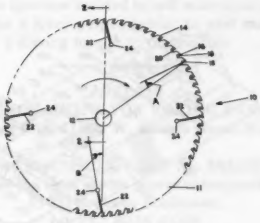


1. Apparatus for cutting band materials comprising means for supporting, in free rotation, a length of said material, fixed cutting means, movable cutting means slidably guided with respect to the fixed cutting means, support means for said fixed and movable cutting means, said fixed cutting means being constituted by a longitudinal profiled member fixed to said support means and having a rounded convex section for contact with the movable cutting means, said movable cutting means being constituted by at least one roller element having a sharp edge engaging the fixed cutting means to cut the band material placed between the fixed and movable cutting means.

3,981,216
LOW NOISE, HIGH SPEED SAW BLADE

Kenneth R. Lemmon, Grand Rapids, Mich., assignor to Lemmon & Snoap Co., Grand Rapids, Mich.

Continuation-in-part of Ser. No. 367,432, June 6, 1973, abandoned. This application Apr. 9, 1975, Ser. No. 566,263
Int. Cl.² B27B *5/38*
U.S. Cl. 83—848 **19 Claims**

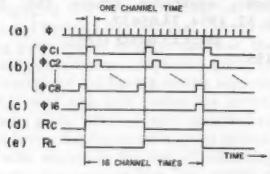


1. In a high speed circular saw blade comprising a plurality of teeth spaced about the outer periphery of the blade, an improvement comprising a plurality of expansion slots formed in the outer edge of the blade at a negative angle of about 5°–15° with respect to lines extending radially from the center of the blade to the outer ends of the expansion slots, said expansion slots being greater than 0 inches and up to about three-thirty seconds (3/32) inches wide.

3,981,217
KEY ASSIGNER

Akiyoshi Oya, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Sept. 2, 1975, Ser. No. 609,846
Claims priority, application Japan, Sept. 5, 1974, 49-102365; Sept. 6, 1974, 49-102640
Int. Cl.² G10F *1/00*
U.S. Cl. 84—1.03 **5 Claims**



1. A key assigner comprising:

key state memory means for storing signals representing previous states of depression and release of respective keys by each key;

a keyboard circuit for simultaneously and parallelly delivering signals corresponding to the ON-OFF states of key switches interlocked with the respective keys;

change detection means comprising a logical circuit for comparing by each key the signals provided from said key state memory means with the signals provided from said keyboard circuit and detecting change from the previous state of the key switches to the present state thereof at a predetermined time interval;

a priority circuit for selectively delivering out a single signal from among change detection signals supplied from said change detection means in accordance with a predetermined priority order at said predetermined time interval;

a key code generator for generating key codes corresponding to the change detection signals provided from said priority circuit;

a key code memory having channels equal in number to a maximum number of tones to be reproduced simultaneously and being capable of storing the key codes in the respective channels;

key state detection means for detecting whether the key code supplied from said key code generator corresponds to a newly depressed key or a released key;

key code loading means for loading the key code from said key code generator in a corresponding channel of said keycode memory if the key code corresponds to a newly depressed key;

a decoder for decoding the key codes provided from said key code memory; and

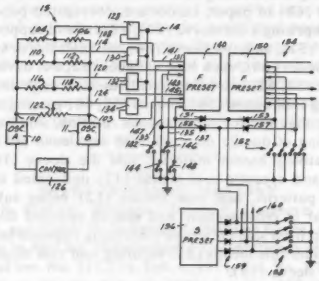
control means for causing said key state memory means to store signals representing states of depression and release of the respective keys in accordance with the decoded signals provided from said decoder;

tone generation control signals being produced on output lines of said decoder corresponding to the respective keys.

3,981,218
PRESET SYSTEM FOR ELECTRONIC MUSICAL INSTRUMENT

David A. Luce, Clarence Center, N.Y., assignor to Norlin Music, Inc., Lincolnwood, Ill.

Filed June 14, 1974, Ser. No. 479,443
Int. Cl.² G10H *1/02*
U.S. Cl. 84—1.24 **11 Claims**

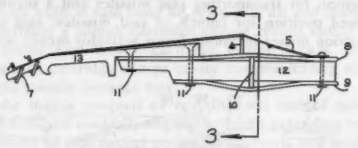


1. In an electronic musical instrument having a signal source, an output system for producing sound waves corresponding to a signal derived from said source, and a plurality of modifying means interposed between said signal source and said output system, the combination comprising a plurality of independently settable function preset units, one for each of said modifying means, each for controlling an operating parameter of said modifying means, a supervisory preset unit having a plurality of noncontinuous discrete operating modes, and connecting means connecting said supervisory preset unit with a plurality of said function preset units for causing said function preset units, irrespective of their prior condition, to control said operating parameters in different predetermined configurations for each operating mode of said supervisory preset unit, one or more of said operating parameters being changed in each configuration.

3,981,219
PRACTICE VIOLIN AND BOW

Robert H. Johns, 3379 Paper Mill Road, Huntingdon Valley, Pa. 19006

Filed Sept. 9, 1974, Ser. No. 504,169
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² G10D *1/02*
U.S. Cl. 84—275 **7 Claims**



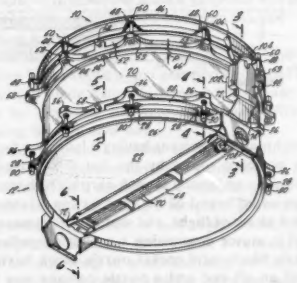
1. For introductory or practice purposes, a body for a violin-type stringed instrument having a neck and a tailpiece, comprising a pair of arched panels spaced approximately parallel to one another to form the top and bottom surfaces of the body, a longitudinal rib separating the body panels, a pair of clamping means for securing at spaced localized areas said neck and said rib in longitudinal alignment, said top panel being fastened at one end by said pair of clamping means between said neck and said rib, said bottom panel being fastened at one end to said rib by at least one of said pair of clamping means, a third clamping means fastening said tailpiece and the other ends of said top panel, said rib, and said bottom panel, respectively, at a third localized area, said panels being otherwise unsupported and free at their peripheries, and a sound post positioned between the panels, the length of said post being sufficient to arch and separate the central portions of the panels from said rib.

4. A bow for a violin-type stringed instrument comprising a shaft having string retaining guide means at its extremities, bow strings wound around the shaft through the string retaining guide means in loops extending lengthwise of the shaft, and a spacer or frog slidably positioned between the shaft and the playing strings on one side of the shaft.

3,981,220
SNARE DRUM WITH TONE RING

Forrest W. Clark, Fountain Valley, Calif., assignor to CBS Inc., New York, N.Y.

Filed Oct. 6, 1975, Ser. No. 619,779
Int. Cl.² G10D *13/02*
U.S. Cl. 84—415 **15 Claims**

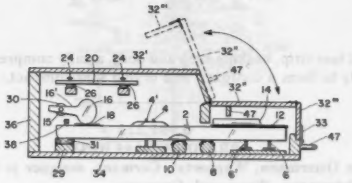


1. A snare drum comprising mutually spaced and interconnected batter and snare head assemblies, a tone ring fixed to said snare head assemby and extending toward said batter head assembly, said tone ring defining a resonating chamber contiguous with said snare head assembly, said chamber having a port extending circumferentially about said drum in relatively close adjacency to said batter assembly and relatively remote from said snare head assembly.

3,981,221
PORTABLE KEYBOARD

Luther A. Wittel, 512 Harwood Ave., Baltimore, Md. 21212

Filed Sept. 2, 1975, Ser. No. 609,534
Int. Cl.² G10C *3/12*
U.S. Cl. 84—423 **5 Claims**



1. A piano type musical instrument comprising a frame, a plurality of individual operatable key bars mounted on said frame in a side-by-side relationship having one end of each of the said key bars extending over an open keyboard area, the portion of the key bars extending over the key board area having means on the upper surface of each key bar for presenting one of two separate colors, the key bars presenting one color extending further over the key board than the other side key bars presenting another color said key bars presenting the second color being selectively spaced in between the key bars presenting the first mentioned color, a single pivot mounted laterally of the frame about which one set of colored bars is pivoted and a second single pivot extending laterally of the frame and in substantially the same horizontal plane with the first mentioned pivot, about which the second set of color key bars is pivoted, the opposite ends of all the key bars being positioned in a single vertical plane, a single selected sound producing element positioned above the opposite end of each of the key bars, a pivoted hammer positioned below each sound producing element and in a horizontal plane extending between the sound producing element and the outer end of the key bars, means on the opposite end of the key bars adjacent the hammer for moving the said hammer in a vertical plane in contact with the same sound producing element, a stop for receiving the opposite end of the key bar members when the said bars are at rest and means for retaining the key bars substantially perpendicular with the horizontal plane of the key board.

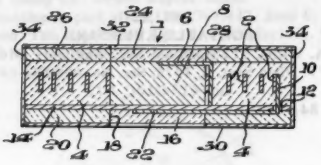
3,981,222
TIME DELAY FUSE

Donald E. Bowman, Baltimore, Md., assignor to Catalyst Research Corporation, Baltimore, Md.

Division of Ser. No. 149,483, Oct. 30, 1961, Pat. No. 3,897,731. This application Mar. 31, 1964, Ser. No. 356,187
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.² F42B *3/10*
U.S. Cl. 86—1 R **3 Claims**

1. A method of making a time delay fuse comprising the steps of overlaying a fuse strip consisting essentially of a paper formed of non-combustible insulating fibers filled with a combustible composition which evolves substantially no gas on burning with a backing strip wider than said fuse strip consisting essentially of a paper formed from noncombustible insulating fibers, both ends of said fuse strip extending beyond and normal to said backing strip, winding said overlaid fuse strip in a flat spiral around the circumference of a cylindrical core formed from non-combustible insulating fibers to form a cylin-

drical body having said both fuse strip ends exposed on the surface of said core while maintaining a high water content in



said fuse strip, backing strip and core, axially compressing said body to form a compact, and drying said compact.

3,981,223

BRAIDING MACHINE

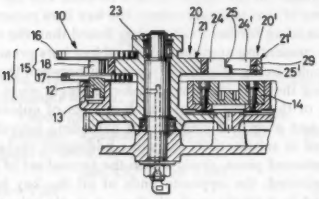
Max Ostermann, Wuppertal, Germany, assignor to W. & M. Ostermann, Wuppertal, Germany

Filed Feb. 25, 1975, Ser. No. 552,786

Claims priority, application Germany, Feb. 27, 1974, 2409341

Int. Cl.² D04C *3/06*

U.S. Cl. 87—50 **13 Claims**



1. In a braiding machine, a combination comprising guide means defining an endless track; a plurality of bobbin supports movable along said track and each having a guide portion engaging said track, and a motion-transmitting portion; means for advancing said bobbin supports along said track, including a plurality of rotary drivers arranged along said track and each having an angularly movable circular plate provided in a circumferential margin thereof with angularly spaced recesses each located in a sector of said plate, the margins of adjacent ones of said plates overlapping one another and said motion-transmitting portions being engageable in said recesses so as to share part of the angular movement of the respective plate prior to engaging the margin of the adjacent plate and entering into a recess of the latter; and sound-damping means provided at said margins at least in the region of initial contact between the respective sector and motion-transmitting portion, such region being located forwardly of the respective recess with reference to said angular movement, so as to reduce the noise resulting from engagement between said margins and said bobbin supports.

3,981,224

MISSILE TRANS PORTER-LAUNCHER

Chester W. Byars, Stow; Edgar L. Van Cott, Weston, and Clifton F. Orchard, Marblehead, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 11, 1975, Ser. No. 595,190

Int. Cl.² F41F *3/04*

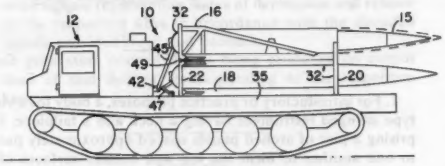
U.S. Cl. 89—1.815 **5 Claims**

1. A missile transporter-launcher for ejection launching of missiles therefrom comprising:

a. a mobile vehicle having a platform thereon;

b. carriage means carried by said platform and having forward and aft ends, said carriage means including a pair of carriages the first of said pair of carriages mounted above the second of said pair of carriages;

c. power erection means carried by said vehicle and operatively connected with said carriage means and the crankshaft of said vehicle for raising and lowering said forward end of said carriage means between a first horizontal position for transporting said missiles and a second inclined position for launch of said missiles; said power erection means including screw activator means secured



to said platform, a member slidably carried by said screw activator means and pivotally secured to said second carriage, a linkage secured to the aft end of each said carriage and said vehicle, a carriage support and slide means secured to said platform for support of said carriage means, whereby movement of said screw activator means moves said carriage means toward the rear of said vehicle on said support and slide means, and said linkage is extended for coaction with said screw activator means for raising said carriage means; and,

d. a low pressure hot gas ejection system carried by said carriage means for ejection launching of said missiles.

3,981,225

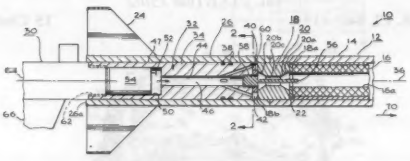
LAUNCHER ARRANGEMENT FOR ROCKET POWERED ROUND

Matthew S. Smith, 4400 Sarah, Apt. 29, Burbank, Calif. 91505, and Ernest A. Filippi, 5859 E. Ida Place, Greenwood Village, Englewood, Colo. 80110

Continuation-in-part of Ser. No. 364,658, May 29, 1973, Pat. No. 3,886,841. This application Mar. 24, 1975, Ser. No. 561,474

Int. Cl.² F41F *3/04*

U.S. Cl. 89—1.818 **15 Claims**



1. In a launching arrangement having a launcher for launching a rocket powered round by the hot pressurized launch gases generated by an ignited launch cartridge charge means, said rocket powered round of the type having a launch phase and a powered phase of flight, and said rocket powered round having a rocket motor comprising a rocket propellent grain, a rocket nozzle block, said rocket nozzle block having a forward end and an aft end and a nozzle passage way between said forward end and said aft end communicating with said rocket propellent grain, and said nozzle passage way having walls defining a convergent section, a divergent section and a throat section and said throat section having a predetermined throat area, and said rocket propellant round having a tubular tailpipe extending from the rocket nozzle block, the improvement to said launch arrangement comprising, in combination:

a launch cartridge means coupled to said launcher and said launch cartridge means comprising a body means slidably

insertable a first predetermined axial distance into said tubular tailpipe of said rocket powered round, and said body means having a forward end adjacent said aft end of said nozzle block of said rocket powered round, and an aft end spaced therefrom;

first walls in said body means defining a launch gas transfer passage way extending between said forward end and said aft end and said gas transfer passage way having a predetermined volume and comprising at least a first portion of an initial launch volume;

second walls in said body adjacent said aft end thereof and defining a launch cartridge charge means cavity for receiving said launch cartridge charge means, and said launch cartridge charge cavity communicating with said gas transfer passage way;

probe means coupled to said forward end of said body means and coaxially aligned with and extending into said throat of said rocket nozzle passageway, and said probe means having a predetermined axial length and a preselected cross sectional area, said preselected cross sectional area of said probe means less than said throat area of said nozzle passage way, to reduce the gas passage area therethrough for the condition of said rocket powered round mounted on said launcher;

whereby the ignition of said launch cartridge charge means generates said hot pressurized launch gases into said gas transfer passage way of said initial launch volume for exerting a launch force on said aft end of said nozzle block to launch said rocket powered round from the launcher and initiate the ignition of said rocket propellant grain.

3,981,226

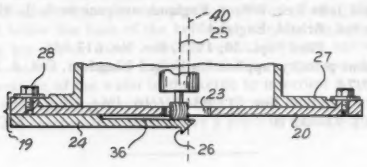
ROTATABLE BASE UNIT FOR A ROUTER FOR TRIMMING LAMINATE PLASTICS

Kenneth N. White, 12650 90th Ave., Palos Park, Ill. 60464

Filed Sept. 27, 1974, Ser. No. 510,116

Int. Cl.² B23C *1/20*

U.S. Cl. 90—12 D **3 Claims**



1. A router for trimming plastic laminate material comprising:

a housing having a base;

a power unit within said housing for rotatably driving a cutting blade about a first axis perpendicular to said base;

said cutting blade extending beyond said base;

means for adjusting the amount of said cutting blade extending beyond said base;

a template follower attached to said base;

said template follower having a guide means for following the contour of a surface of a template material;

said guide means including a template abutment engaging a perpendicular surface of said template material;

said template abutment disposed in a vertical plane;

means for adjusting in a substantially horizontal direction said template follower and for aligning said blade comprising said base rotatably attached to said housing about a second axis perpendicular to said base;

rotation of said housing adjusting the position of said blade relative to said guide means; and

a clearance space between said base and said template follower for insertion of a material to be trimmed by said blade.

3,981,227

POWER PISTON OF BOOSTER

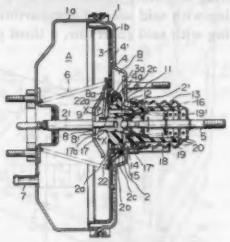
Tomizo Azuma, Yamato, Japan, assignor to Tokico Ltd., Japan

Filed Dec. 18, 1974, Ser. No. 533,754

Claims priority, application Japan, Dec. 29, 1973, 49-363

Int. Cl.² F15B *9/10*; F01B *19/00*; F16J *3/02*

U.S. Cl. 91—376 R **3 Claims**



1. A power piston assembly for use in a booster, said assembly comprising:

resilient diaphragm means within said booster for dividing the interior of said booster into two chambers, said diaphragm means having a first opening therethrough;

rotatable piston plate means adjacent said diaphragm means for receiving the differential pressure caused by the pressure difference between said two chambers, said piston plate means having a second opening therethrough of non-circular configuration coaxially aligned with said first opening; and

valve means adjacent the side of said diaphragm means opposite the side adjacent said piston plate means, extending through said first and second openings, and fitted against the side of said piston plate means opposite the side thereof and adjacent said diaphragm means for controlling communication between said two chambers and for resiliently holding said diaphragm means against said piston plate means, said valve means having:

a main body portion adjacent said diaphragm means,

a neck portion projecting axially from one end of said main body portion and extending through said first and second openings, and

a head portion of non-circular configuration attached to the free end of said neck portion extending through said first and second openings, said head portion slidable through said first and second holes, and in contact with said rotatable piston plate means when said piston plate means is rotated relative to the position of said head portion.

3,981,228

HYDRAULIC CONTROL SYSTEM

Edmund Maucher, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 24, 1974, Ser. No. 517,810

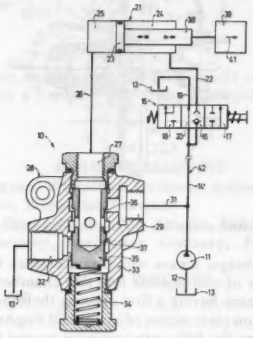
Claims priority, application Germany, Nov. 13, 1973, 2356607

Int. Cl.² F15B *11/08*, *13/042*

U.S. Cl. 91—415 **9 Claims**

1. A hydraulic control system, comprising a double-acting user having a first and an oppositely acting second pressure-fluid compartment and a pressure responsive element therebetween and being arranged to move in a first direction counter to the urging of a load at one speed which is substantially uniform over the entire stroke length, and in a second direction with or without the urging of a load; a fluid reservoir; a source of pressure fluid communicating with said fluid reservoir; first conduit means having one section communicating with said first compartment, and another section communicating with said source; second conduit means communicating with said reservoir; and means for effecting movement of said

element in said second direction without the urging of a load at another speed which is also substantially uniform over the entire stroke length, comprising control valve means interposed in said first conduit means and movable between a first position in which it connects said sections with one another, and a second position in which it connects said second conduit means with both of said sections, and pressure-reducing and pressure-limiting actuating valve means, including a first port communicating with said second compartment, a second port communicating with said reservoir, a third port communicating with said other section of said first conduit means, and pressure-limiting means operative for limiting the fluid pressure in said second compartment, said pressure limiting means comprises a valve member having a pressure responsive face directly and continuously open to said second compartment, said valve member being movable between one position in which it normally connects said third port with said first port, another position in which it connects said first port with said second port, and a further position in which it disconnects all of said ports from one another; and biasing means normally biasing said valve member to said one position.



3,981,229

GAS POWERED MOTOR

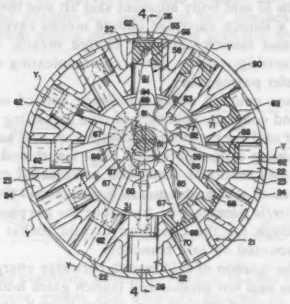
John H. Breisch, Lakewood, Ohio, and William L. Brown, 4th, Pine Grove Mills, Pa., assignors to Midland-Ross Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 378,334, July 11, 1973, abandoned, which is a division of Ser. No. 173,832, Aug. 23, 1971, abandoned. This application June 27, 1974, Ser. No. 483,575

Int. Cl.[2] F01B *1/00*; F02N *7/02*

U.S. Cl. 92—72 **10 Claims**

1. A motor adapted to be powered by pressurized gas and suitable for use as a starter motor for small internal combustion engines comprising housing means having an axis and a plurality of cylinders disposed generally radially around said axis; crank means having a shaft portion supported from said housing means for rotation about said axis, and having a crank pin portion offset from said axis of said housing means; pistons mounted in said cylinders, said pistons being formed of stiff resilient material, each of said pistons having a socket opening therein; connecting rod mounting means rotatably mounted on said crank pin portion, said connecting rod mounting means having a plurality of openings therein corresponding to a plurality of said cylinders; a plurality of identical connecting rods, each of said connecting rods being symmetrical about an axis extending perpendicular to the longitudinal axis thereof and each having a first enlarged end portion that is held in a socket of one of said pistons, said first enlarged end portion and the piston socket in which it is held being shaped so that due to the resilience of said material of which said piston is formed said first enlarged end portion of said connecting rod may be snapped into said socket and thereafter pivotally but firmly held in said socket in such manner that no substantial movement of the connecting rod with respect to the piston in directions parallel to the axis of the piston can take place during operation of the engine, said connecting rod having at its other end a second enlarged portion identical to said first enlarged end portion pivotally but firmly connected to said connecting rod mounting means solely by the shape of said second enlarged portion and of the shape of the opening in said connecting rod mounting means in which it is disposed without use of a pivot pin or the like.



3,981,230

APPARATUS FOR THERMALLY MACHINING THERMOPLASTICS SHEET

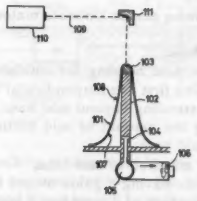
Michael John Lee, Didcot, England, assignor to A. J. Bingley Limited, Bristol, England

Filed Sept. 29, 1975, Ser. No. 617,656

Claims priority, application United Kingdom, Oct. 3, 1974, 43027/74

Int. Cl.[2] B31B *1/16*, *1/64*

U.S. Cl. 93—33 H **8 Claims**



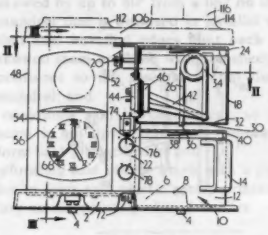
1. Apparatus for thermally machining thermoplastics sheet with a laser, comprising at least one backing member of a material having a high coefficient of absorption of radiant energy at the wavelength emitted by the laser, a low thermal diffusivity and good resistance to thermal shock, means for tensioning the thermoplastics sheet over the backing member so that it is maintained in intimate thermal contact with the backing member where it is deflected thereby, means for focussing radiation from the laser on to the sheet where it lies over the backing member and means for scanning the focussed laser radiation over the sheet.

3,981,231

BEVERAGE-MAKING APPARATUS

Frederick Simm Grundy, Leigh, and John Byron King, Mossley, both of England, assignors to Pifco Limited, Manchester, England

Filed Oct. 3, 1975, Ser. No. 619,162
Int. Cl.[2] A47J 31/047
U.S. Cl. 99—280 5 Claims



1. A beverage-making apparatus comprising a water-heating kettle with removable lid means which when fitted on said kettle results in the interior of the kettle being in substantial fluid-tight isolation from the surrounding atmosphere, said kettle being provided with an electrically powered heating element connected to a control circuit for connection to a supply of electrical current, a syphon tube provided inside the kettle and having an open end disposed adjacent to the base of said kettle, said tube having a first tube portion extending upwardly from said end to a second tube portion comprising more than one coil of tube to prevent or impede pre-syphoning, and a third tube portion extending downwardly from the second tube portion to an open second end of the tube disposed below the base of the kettle for introducing hot water into a tea-pot or other infusion vessel, disposed below the kettle, and a thermally operated device responsive to the temperature of the water in the kettle to interrupt a conductive path supplying electrical energy to said heating element, when the temperature rises above a predetermined value.

3,981,232

FREE STANDING FRYER

Donald Farrington Williamson, 16 Shasta Drive, Thornhill, Ontario, Canada

Filed June 20, 1975, Ser. No. 588,864
Int. Cl.[2] A47J 37/12
U.S. Cl. 99—337 9 Claims

1. A free standing fryer unit adapted for use in an enclosed space without connection to a ventilation system, said unit comprising:

a cabinet adapted to be supported at a suitable working height and having a floor, a roof and sides, at least one of said sides being open for access to the interior;

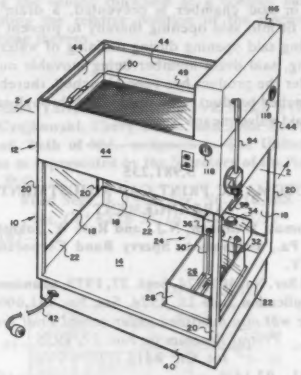
a cooking receptacle located in said cabinet in a predetermined location and adapted to be connected to a source of heating power;

outlet means located in said roof above said receptacle for passage of fumes from said cabinet and incorporating exhaust fan means;

wall means defining a chamber having an open side, located above said roof;

opening means in said wall means for passage of fumes from said exhaust fan means into said chamber; and,

filter means removably positionable in said open side of said chamber whereby said fumes may pass therethrough, said filter means being absorptive of the odour of said fumes



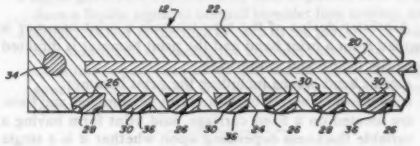
and in a sufficient quantity to effectively deodorise the same for a reasonable working period.

3,981,233

ANTI-STICK GRILL

Anthony R. Nugarus, Chicago, Ill., assignor to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Oct. 3, 1975, Ser. No. 619,297
Int. Cl.[2] A47J 37/06
U.S. Cl. 99—422 15 Claims



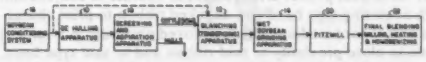
1. A grill, comprising a platen having a grilling surface, a heating means for heating said platen and said grilling surface, a plurality of spaced recesses in said grilling surface and extending inwardly toward said heating means and into the main body of said platen, each said recess having associated retention means, a discrete polytetrafluoroethylene body in each said spaced recess and held in its recess by said retention means and having a surface portion disposed at said grilling surface for contact with an object to be disposed against said grilling surface for grilling.

3,981,234

APPARATUS FOR THE PREPARATION OF A SOYBEAN BEVERAGE BASE

Alvin I. Nelson, Champaign, Ill.; B. P. N. Singh, and Surjan Singh, both of Uttar Pradesh, India, assignors to University of Illinois Foundation, Urbana, Ill.

Filed May 9, 1974, Ser. No. 468,269
Int. Cl.[2] A23C 3/02, 9/02, 13/04, 15/04
U.S. Cl. 99—483 10 Claims



6. An apparatus for blanching food products, comprising a blanching chamber positioned so that the axis thereof extends generally vertically, said chamber having an opening in the bottom end thereof, valve means for closing said opening so

that water may be retained in said chamber, means for introducing steam into said chamber so that products contained therein may be agitated during boiling thereof whereby excessive foam in said chamber is prevented, a drain member adapted to fit into said opening thereby to prevent products from entering said opening during draining of water through said opening, said drain member being movable out of said opening after the product has been blanched, thereby to permit the blanched product to be discharged through said opening when said valve means is opened.

3,981,235
AUTOMATIC PRINT GAP ADJUSTMENT ARRANGEMENT

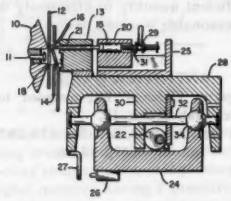
Roy D. Thomas, Wenonah, N.J., and Ross W. Johnston, Norristown, Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 401,524, Sept. 27, 1973, abandoned. This application June 21, 1974, Ser. No. 481,600

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.[2] B41J *1/20*

U.S. Cl. 101—93.14 **7 Claims**



1. A printer device of the type wherein a print hammer is separated from a print band and the print hammer is directed toward the print band comprising,

a. a print head means including the print hammer;

b. a print form wherein both the print head means and form are located on a fixed carriage, said print form having a variable thickness depending upon whether it is a single or multi-part form;

c. a movable print type band;

d. a ribbon wherein both said band and ribbon are located on a movable carriage, said ribbon having a thickness which is variable upon replacement;

e. means located in proximity to said movable carriage for simulating the print hammer striking said ribbon and form;

f. means responsive to said simulation of the print hammer for positioning said print band the required distance from said print hammer.

3,981,236
PRINTHEAD FOR IMPACT PRINTER

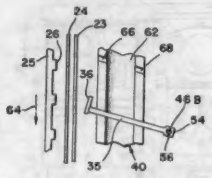
Ross W. Johnston, Norristown, and Barrie W. Witty, Glenside, both of Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 449,865, March 11, 1974, abandoned. This application Nov. 3, 1975, Ser. No. 628,341

Int. Cl.[2] B41J *1/20*

U.S. Cl. 101—93.14 **1 Claim**

1. An impact printer arrangement to operate in conjunction with a rotating type band and an inked ribbon to print characters on a record medium which is moved upwardly in a vertical plane in close proximity to said ribbon and to said type band, said type band formed and disposed to define a rotating path which lies perpendicular to said vertical plane, comprising: a hammer guide assembly formed and disposed to lie perpendicular to said vertical plane and to have a first side lying substantially parallel to said rotating path and in close proximity to said record medium, to said inked ribbon, and to said type band; said hammer guide assembly formed to have grooves therein, which grooves lie in a horizontal plane and which grooves are formed to lie at an angle less than 90° from said vertical plane with said angle opening toward the direction toward which said rotating type band is moving; a plurality of impact printer hammers each having a stricker face member formed integral with a hammer arm, each of said impact printer hammers disposed to have its hammer arm mounted in a different one of said grooves and further disposed in its associated one of said grooves so that its striker face member



lies opposite said rotating path of said type band and so that when it is moved toward said type band it will strike said type thereon and which striker face member lies at a small angle from said vertical plane and which angle opens toward the direction from which said rotating type band is moving during its rotation; and means to drive each of said impact printer hammers toward said record medium, toward said inked ribbon, sand toward said type band whereby said striker face members will force said record medium against said ribbon and said type bands to effect printing of characters thereon with a minimum of smearing.

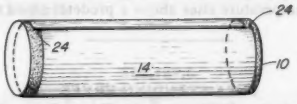
3,981,237
PLASTIC ROTARY PRINTING SCREENS CONSTRUCTION METHOD THEREFOR

John M. Rhodes, Box 343, Summit, N.J. 07901

Continuation-in-part of Ser. No. 334,267, Feb. 21, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,736

Int. Cl.[2] B41C *1/14;* **B41N** *1/24*

U.S. Cl. 101—128.2 **9 Claims**



1. In the manufacture of a rotary printing screen having perforations through which printing emulsions and pastes are forced for rotary screen printing of textiles while mounted on a rotary printing machine without internal support, an improved method for precision fabrication from plastic film of a plastic rotary printing screen having the thinness, extremely high bending modulus, resistance to denting, and precise construction of a metal screen, the chemical inertness of a silk screen, non-hygroscopicity, a scratch-resistant hard surface, and a maximum circumferential variation of ± 0.1%, comprising the following steps, in combination:

A. manufacturing a plastic blank according to the following steps:

1. providing a sheet of film of a high-melting, difficulty soluble, linear, highly polymerized ester of a bi-functional dicarboxylic acid and a glycol of the series $HO(CH_2)_nOH$, wherein n is an integer within the range of 2 to 10, said sheet having a thickness of 0.002 to 0.012 inch, a length greater than the length of said plastic blank, opposite edges in parallel with the machine direction thereof, a width between said opposite

edges that is less than the circumference of said plastic blank, a modulus of elasticity of at least 5×10^5 psi, and a capability of exceeding 100,000 folding cycles as measured by ASTM test D2176-69;

2. bevelling said opposite edges at a bevel angle of about 10°–60° to form bevelled edges;

3. wrapping said sheet of film around a mandrel, having an axis and a diameter tolerance of about 0.002 inch, with said machine direction generally corresponding to said axis and with said bevelled edges opposed and skewed by up to 60° from a line on the surface of said mandrel that is disposed in parallel with said axis, so that said bevelled edges abut each other to form a skewed seam and said wrapped sheet of film precisely conforms to the circumferential dimensions of said mandrel; and

4. conjoining said bevelled edges, so that said skewed seam is not detectable, and trimming said length to form said plastic blank; and

B. perforating said plastic blank with a plurality of minute holes to form said plastic rotary printing screen for said rotary screen printing of said textiles.

3,981,238
METHOD AND APPARATUS FOR DETERMINING DOCTOR BLADE POSITION IN A ROTOGRAVURE PROCESS

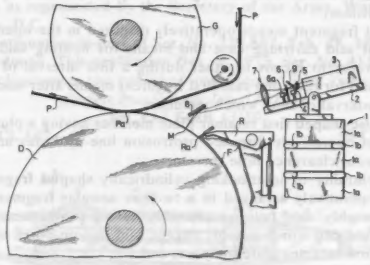
Mamiliano Dini, Elba, Italy, assignor to European Rotogravure Association, Munich, Germany

Continuation of Ser. No. 400,196, Sept. 24, 1973, abandoned. This application June 6, 1975, Ser. No. 584,534

Claims priority, application Germany, Sept. 27, 1972, 2247351

Int. Cl.² B41F 9/10

U.S. Cl. 101—154 **25 Claims**



1. A method for determining and automatically adjusting the relative position between a doctor blade and printing cylinder in a doctor blade rotogravure printing process using only a light beam in direct contact with the printing cylinder said method comprising:

transferring ink onto a rotogravure printing cylinder in surplus amounts;

stripping off all but a residual ink film portion of the surplus ink by the doctor blade leaving engraved cells in said printing cylinder substantially loaded with ink and also leaving said residual ink film on the non-engraved portions of said cylinder;

determining the thickness of the layer of residual ink film which passes by the doctor blade by directing an incident light beam through said residual ink film, reflecting the incident light beam from said predetermined non-engraved portions of said rotogravure printing cylinder back through said residual ink film a second time and sensing the resulting attenuated intensity of the reflected light beam which has thus been attenuated by two passages through said residual ink film to a degree representative of the thickness of said ink film; and

utilizing the sensed thickness as a control parameter in adjusting the relative position of the doctor blade in response thereto.

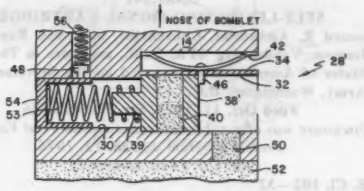
3,981,239
FLUIDIC LINK MASTER/SLAVE FUZE SYSTEM

Norman Czajkowski, Chevy Chase, and John H. S. McMann, Highland, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 4, 1975, Ser. No. 610,468

Int. Cl.² F42B 25/16; F42C 15/32

U.S. Cl. 102—7.2 **15 Claims**



9. A fuzing system for cluster munitions having a dispenser and a plurality of bomblets in the dispenser, each bomblet having a fuze comprising:

a dispenser fuze to control the opening of the dispenser and the arming of the bomblets;

a signal generator controlled by said dispenser fuze to produce a fluidic signal to control bomblet fuze arming; and

a signal receiver in the fuze of each of the plurality of bomblets, said receiver placing the bomblet fuze in the enabled condition upon receipt of the signal from said signal generator and arming the bomblet fuze upon dispenser opening and pressure release.

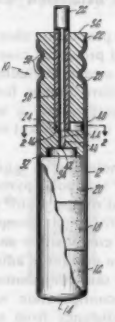
3,981,240
DETONATING CAP ASSEMBLY AND CONNECTING BUSHING

Ernest Laird Gladden, Granby, Conn., assignor to The Ensign-Bickford Company, Simsbury, Conn.

Filed July 30, 1975, Ser. No. 600,221

Int. Cl.² F42B 3/10

U.S. Cl. 102—29 **14 Claims**



1. A detonating cap assembly adapted for use with a fuse having a propensity for accumulating a static charge comprising an elongated shell open at one end for receiving said fuse, a charge positioned in said shell and spaced from said one end,

and a fuse retaining bushing positioned in said shell at said open end for interconnecting said fuse to said shell, said bushing being an elongated member slidably received within said shell and having a confined end adjacent said charge and an exposed end remote from said charge, a longitudinal bore in said bushing for receiving said fuse, said bore extending from said exposed end to adjacent said confined end, said bushing having a rupturable membrane at said confined end terminating said bore, said bushing including a low resistance shunt path positioned adjacent said membrane and intermediate said membrane and the exposed end of said bushing, said shunt path extending laterally outwardly from said bore toward said shell for diverting static charge from said fuse toward said shell.

3,981,241

SELF-LEVITATING SIGNAL CARTRIDGE

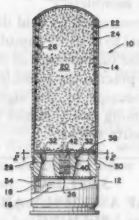
Leonard R. Ambrosini, Churchville, Md., and Raymond S. Isenson, Vandenberg AFB, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 11, 1973, Ser. No. 405,726

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² F42B *4/06, 4/26*

U.S. Cl. 102—32 **2 Claims**



1. In a pyrotechnic signal cartridge comprising:

a. a cartridge case,

b. a projectile case detachably secured to said cartridge case,

c. a projectile initial propulsion charge in said cartridge case for launching said projectile case,

d. a rocket motor means, including a plurality of rocket nozzle ports, closure means for said ports positioned within said projectile case, a solid pyrotechnic signal composition, and a solid rocket motor propellant composition,

e. ignition means including an ignition composition and a delay column for said solid pyrotechnic signal composition and said solid rocket motor propellant composition, wherein the improvement comprises, said solid rocket motor propellant composition and said solid pyrotechnic signal composition present in admixture in said projectile case and wherein said compositions present in admixture have a conical configuration with diameter gradually decreasing with distance from said rocket nozzle parts such that burning of said compositions in admixture after launching of said projectile case balances the thrust of the rocket motor means against the mass of the cartridge providing a thrust-to-weight ratio of approximately unity which effect causes a self levitating display.

3,981,242

INFRASTAR CANNISTER CARTRIDGE

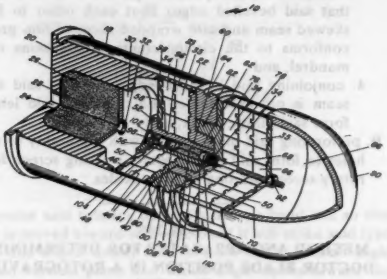
Edgar M. Shurtleff, Downey, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 15, 1974, Ser. No. 443,163

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² F42B *7/04, 13/18, 13/48*

U.S. Cl. 102—42 R **3 Claims**



1. An internally fragmenting stage released cartridge which comprises:

a cup shaped cartridge case having a partialy closed end and an open end;

a primer fixedly axially positioned in said closed end;

propellant means operatively positioned within said cartridge case adjacent said primer for generating gas pressure within said cartridge case upon initiation by said primer;

first fragment means operatively disposed in the open end of said cartridge case and means for holding said first fragment means together during a first interval of time and for releasing said first fragment means after said first interval of time which includes;

a disc shaped first retainer plate member having a plurality of operatively disposed protrusion line-up bores and an axial clearance hole therein;

a plurality of interlocking cylindrically shaped fragments operatively arranged in a two-tier annular fragment assembly, said two-tier assembly having protrusions on a first end which slidably engage said line-up bores in said first retainer plate member; and

a disc shaped second retainer plate member having a plurality of operatively disposed protrusion line-up bores therein, and a central threaded hole therein, said annular fragments assembly also having protrusions on its second end which slidably engage said line-up bores in said second retainer plate member;

second fragment means attached to said first fragment means and means for holding said second fragment means together during said first interval of time and for releasing said second fragment means after a second interval of time; and

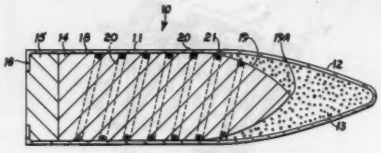
means for releasing said first fragment means comprising delay means axially positioned within said first fragment means operatively disposed adjacent said means for releasing said second fragment means for sequentially initiating the release of said first and second fragment means so that a double cone pattern of shot is generated by firing of said cartridge;

wherein said delay means passes through said axial clearance hole and said fragment assembly to threadedly engage the central threaded hole of said second retainer plate member.

3,981,243
PROJECTILE

Thomas A. Doris, Jr., Palmyra, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 10, 1975, Ser. No. 585,648
Int. Cl.² F42B *13/02*
U.S. Cl. 102—52 **2 Claims**

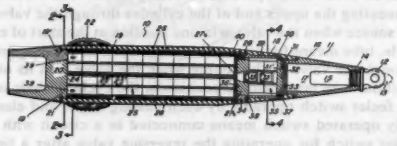


1. An incendiary projectile comprising,
a projectile main body having a forward nose portion and a rearward annular flange, said nose portion containing an incendiary mix,
a base plug secured in said main body against said annular flange,
a penetrator positioned within said main body forwardly adjacent said base plug,
said penetrator having a spiral groove in its peripheral surface, and
a lead sheathed incendiary mix in said groove and in contact with said nose portion incendiary mix.

3,981,244
PYRAMID PROJECTILE PAYLOAD EJECTION DEVICE

Louis J. Adimari, Lake Hiawatha, and George D. Dusoe, Oak Ridge, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 229,847, Feb. 28, 1972, abandoned. This application Nov. 2, 1973, Ser. No. 412,068
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² F42B *13/50*
U.S. Cl. 102—69 **9 Claims**

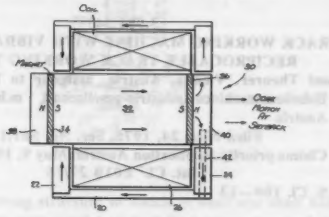


1. A projectile for dispensing a payload at a selected point along its trajectory, comprising:
a housing including a forward ogive portion, a rear separatable base plug portion, and an intermediate hollow cylindrical portion filled with a first payload,
an elongated hollow cylindrical pusher assembly means adjacent to said first payload and slidingly disposed substantially entirely within said ogive portion for movement rearwardly in said housing, with at least an annular portion of its peripheral wall in bearing contact with the inner wall of said housing, said pusher assembly means being open at its rear end and closed at the other end and filled with an additional payload,
an expulsion charge means disposed within said ogive portion forward of said pusher assembly means for explosively generating an expanding gas, and
fuze means for selectively activating said charge means;
whereby, upon activation of said charge means, said gas and said pusher assembly means will eject both of said payloads rearwardly from said housing.

3,981,245
ELECTRICAL SETBACK GENERATOR

Colby E. Buzzell, Wilmington, Mass., and Richard T. Ziemba, Burlington, Vt., assignors to General Electric Company, Burlington, Vt.

Filed Dec. 17, 1974, Ser. No. 533,682
Int. Cl.² F42C *11/04*
U.S. Cl. 102—70.2 GA **26 Claims**

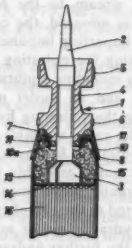


1. A setback generator comprising:
a first incomplete magnetically permeable circuit;
an electrical conductor magnetically coupled to said circuit;
a second incomplete magnetically permeable circuit including two sources of magnetic flux of opposing polarity spaced apart by magnetically permeable means of such length that only one of said sources can be coupled to said first circuit at any time;
said first and second circuits being mutually interjournalled to permit relative translation therebetween, whereby first one of said sources and then the other of said sources can be coupled to said first circuit to provide a complete reversal of magnetic flux through said first circuit and a corresponding energy in said electrical conductor.

3,981,246
FIN-STABILIZED SUBCALIBER PROJECTILE

Hans Werner Luther, Holzbuttgen, and Peter Bender, Dusseldorf, both of Germany, assignors to Rheinmetall G.m.b.H., Dusseldorf, Germany

Filed May 2, 1974, Ser. No. 466,224
Claims priority, application Germany, May 9, 1973, 2323244
Int. Cl.² F42B *13/16*
U.S. Cl. 102—93 **3 Claims**



1. A fin-stabilized subcaliber projectile having a drive cage comprising
a plurality of segments surrounding the body of said projectile in a central region thereof,

a tail disc fastened to said cage and jointly covering said segments, said disc having joints and tearing in the region of the joints upon the release of said cage,

a plurality of reinforcing segments corresponding to said drive-cage segments and defining said joints between them,

a burnable cartridge case, and

at least one connecting piece connecting said burnable cartridge case, said reinforcing segments and said disk to the tail of

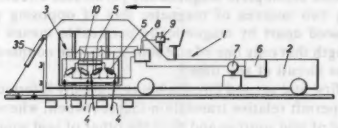
said drive cage after the other and by means of non-burnable fastening means.

3,981,247

TRACK WORKING MACHINE WITH VIBRATORY AND RECIPROCABLE TRACK WORKING TOOLS

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industrie-gesellschaft m.b.H., Vienna, Austria

Filed Mar. 24, 1975, Ser. No. 561,115
Claims priority, application Austria, May 9, 1974, 3855/74
Int. Cl.² E01B 27/16
U.S. Cl. 104—12 10 Claims



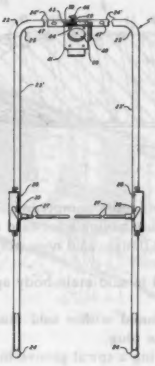
1. A track working machine comprising a frame mounted for mobility on the track, reciprocable and vibratory tools mounted on the frame for working the track, hydraulic motor means for reciprocating and vibrating the tools, the hydraulic motor means including a hydraulic motor associated with each tool for reciprocating the same and a further hydraulic motor, a hydraulic circuit including a hydraulic fluid sump, a pump for delivering hydrualic fluid from the sump to the hydraulic motor means and return conduit means for returning hydraulic fluid to the sump, and a control in the hydraulic circuit for generating a pulsating stream of the hydraulic fluid and delivering the pulsating stream to the hydraulic motor means whereby the tools are vibrated, the control including an impulse generator for imparting impulses to the hydraulic fluid and thereby generating the pulsating hydraulic fluid stream, and a valve assembly including a plurality of check valves and having inlet means and an outlet means, control conduit means for delivering the pulsating hydraulic fluid stream to the inlet means of the valve assembly, further conduit means for delivering the pulsating hydraulic fluid stream from the outlet means of the valve assembly to respective chambers defined by the hydraulic motor means, the further conduit means being connected to the chambers of the further hydraulic motor and the hydraulic motor associated with each tool being connected to the further hydraulic motor for vibration of the hydraulic motor and the tool associated therewith by the further hydraulic motor, and the hydraulic motor reciproacting the tool, and respective ones of the valves alternately blocking and permitting passage of the pulsating hydraulic fluid stream from the inlet to the outlet means of the valve assembly.

3,981,248

TIMING GATE FOR SKI-LIFTS

Phillip D. Savage, Owls Head, N.Y., assignor to Hall Ski-Lift Company, Inc., Watertown, N.Y.

Filed Feb. 28, 1975, Ser. No. 554,200
Int. Cl.² B61B 12/00
U.S. Cl. 104—173 ST 1 Claim



1. A gateway for admitting a predetermined number of passengers abreast to a ski-lift loading area, comprising: an inverted U-shaped frame having two vertical legs and a cross arm and adapted to be supported erect on the ground, at least one two-way pneumatic cylinder secured at substantially waist-high level to a frame leg and having a piston with spaced seals adjacent either end, the cylinder having a helically-disposed quarter-turn slot in its wall, the piston in the cylinder having an elongated rod-like gate member secured thereto between the seals and projecting radially therefrom through the cylinder slot for guiding the gate member as the piston moves up and down, the gate member having a closed position transverse the gateway when at one end of the slot and an open position swung 90° from the closed position when at the other end of the slot, a source of compressed air under pressure, an electrically operated reversing valve, tube means for connecting the upper end of the cylinder through the valve to the source when the valve is in one position at the start of each cycle, tube means for connecting the lower end of the cylinder through the valve to the source when the valve is in its other position in its intermediate position in the cycle, a chair-sensing feeler switch operable by each passing chair, and electrically operated switch means connected in a circuit with the feeler switch for operating the reversing valve after a timed delay when the feeler switch is operated by a passing chair for initiating each succeeding cycle, the piston and gate member being adapted to fall by gravity to the gate closed position upon any failure of the source of compressed air.

3,981,249

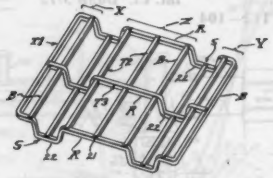
LOAD BEARING PALLET

John R. Herrmann, Tustin, and Robert L. Alexander, Newport Beach, both of Calif., assignors to G. S. Beckwith Gilbert, Greenwich, Conn.

Filed Oct. 17, 1974, Ser. No. 515,498
Int. Cl.² B65D 19/30
U.S. Cl. 108—52.1 4 Claims

1. A load bearing pallet fabricated of elongated formable members of tubular cross section for torsional stability, there being a frame work comprised of a plurality of spaced and parallel transversely disposed and rigid load bearing members in a common plane with and extending between and intersect-

ing spaced and parallel longitudinally disposed rigid rail members, said transversely and longitudinally disposed tubular members being joined at notched interconnections thereof wherein each tubular member is notched with a seat bottom



disposed normal to said tubular cross section and formed by piercing the same at spaced parallel lines with one side thereof depressed to the mid plane of the tube, the seat bottom of the notch in one member bearing against the seat bottom of the notch in the complementary intersecting member.

3,981,250

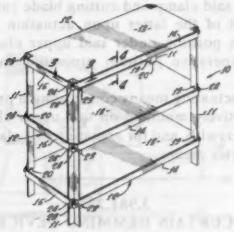
ADJUSTABLE SHELVING

Russell E. Anthony, 1575 Chanticleer, Anaheim, Calif. 92802

Filed Aug. 18, 1975, Ser. No. 605,749

Int. Cl.² A47B 9/00

U.S. Cl. 108—106 **15 Claims**



1. An adjustable shelf device comprising

at least one member defining a support surface,

said member having a plurality of corners,

each of said corners including first and second edges extending from outer ends thereof at the periphery of said support surface to intersecting inner ends thereof so as to define a notch,

an element extending across said notch of each of said corners between said outer ends of said edges so as to cooperate with said edges in defining an opening,

a post means received in each of said openings, said post means comprising a structural angle having an L-shaped cross section having outer surfaces on one side in juxtaposition with said edges, and

friction means between said element and the inner surface of said structural angle for releasably holding said member in a fixed relationship with said post means.

3,981,251

ARRANGEMENT AT CORNER JOINTS IN A KNOCK-DOWN SHELVING UNIT

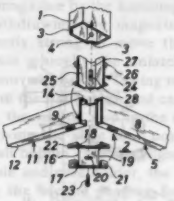
Ejvind Damberg, Nykobing Falster, Denmark, assignor to A/S Raaco Storage Systems, Denmark

Filed Mar. 21, 1975, Ser. No. 560,570

Claims priority, application Denmark, Oct. 11, 1974, 5343/74

Int. Cl.² A47B 3/06

U.S. Cl. 108—154 **2 Claims**



1. In a shelving structure in which at least one shelf has a corner portion connected to a post by a screw received in a hole of the post, said shelf being generally horizontal and having vertical flanges with horizontal flanges adjoining said corner portion, said vertical and horizontal flanges having end edges at said corner portion, and there being a mounting brace means extending obliquely between said vertical flanges, said brace means having lugs received by slots in said horizontal flanges, and a hole for the extension therethrough of said screw, the improvement which comprises a protective bridge means having a pair of protective plates connected together by a flexible central portion, said plates having lugs disposed for resilient engagement with corresponding flanges of the shelf to retain the bridge means at the corner portion of the shelf with said protective plates against said end edges and covering same to protect the post against abrasion thereby, said protective plates having respective surfaces each disposed for contact with the post and accommodating movement of the shelf with said surfaces in sliding contact with the post without abrasion of the post; and means defining a hole in said bridge means aligned with the hole in said brace means and disposed to engage the threads of said screw and to align said screw with the hole in the post.

3,981,252

NON-POLLUTING DISPOSAL OF ANTIFOULING PAINT RESIDUES ENCOUNTERED IN SHIPYARD ABRASIVE BLASTING OPERATIONS

Arthur Ticker, 12117 Maddox Lane, Bowie, Md. 20715

Filed Dec. 3, 1975, Ser. No. 637,421

Int. Cl.² F23G 7/00

U.S. Cl. 110—18 R **7 Claims**

1. A safe, non-polluting method of handling and neutralizing the toxic nature of organo-metallic antifouling paint residue removed from ships comprising the steps of:

removing the organo-metallic antifouling paint from a ship's hull as by abrasive blasting or other mechanical means;

collecting the residue of said organo-metallic antifouling paint and spent abrasive blasting material;

placing said residue of organo-metallic paint and abrasive material in a vapor-tight muffle furnace;

heating said residue in said furnace in the presence of air for a period of time above its ignition temperature and the ignition temperature of its vapors;

whereby said organo-metallic material is destroyed to yield carbon dioxide, water vapor and a non-toxic, non-organic metal oxide; and

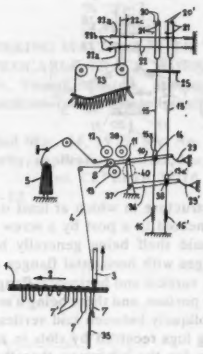
unloading the detoxified material for recycling or safe disposal.

3,981,253

DEVICE FOR MAKING TUFT FABRIC

Rene Neyraud, Rhone, France, assignor to Verdol S.A., Caluire et Cuire, France

Filed Feb. 5, 1975, Ser. No. 547,151
Claims priority, application France, Feb. 14, 1974, 74.05651
Int. Cl.² D05C 15/18
U.S. Cl. 112—79 A 6 Claims



1. A device for feeding a thread at more than two different linear speeds in a tuft making machine, said device comprising:

a friction roller to frictionally advance said thread;

a first cylinder rotating at a first peripheral speed about its axis to frictionally drive said friction roller at a first angular speed so as to advance said thread at a first linear speed;

a second cylinder rotating at a second peripheral speed about its axis to frictionally drive said friction roller at a second angular speed so as to advance said thread at a second linear speed, the axis of said second cylinder being parallel to the axis of said first cylinder to define a plane therewith;

a first movable supporting member to rotatably support said friction roller;

a second movable supporting member to support said first supporting member;

first means to displace said first supporting member on said second supporting member in such a direction that for a first position of said second supporting member said friction roller may engage selectively said first and second cylinders to be driven by same at two different linear speeds;

second means to displace said second movable member between said first position and a second position more remote from said plane and for which said first means can no more bring said friction roller into engagement with said first and second cylinder;

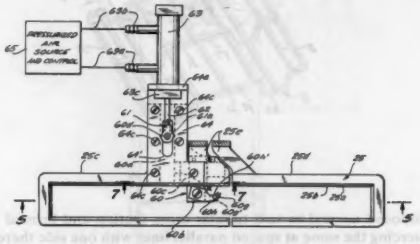
and at least a third cylinder rotating at a third peripheral speed, the axis of said third cylinder being parallel to the axes of said first and second cylinder, and being so disposed laterally of said plane that for said second position of said second supporting member, said first means may bring said friction roller into engagement with said third cylinder to cause said roller to be driven at a third angular speed so as to advance said thread at a third linear speed.

3,981,254

AUTOMATIC NECKTIE NECKBAND TACKER

Stanley Franklin, Northridge, Calif., and Herbert Jaffe, New York, N.Y., assignors to Stanley Franklin, Los Angeles, Calif.; Herbert Jaffe, New York, N.Y. and Harold Athey, Los Angeles, Calif., part interest to each

Filed Dec. 29, 1975, Ser. No. 645,197
Int. Cl.² D05B 3/12
U.S. Cl. 112—104 7 Claims



1. In a tacking machine, an automatic necktie neckband tacker, comprising

a gauge including inner peripheral edge means defining an opening substantially equal to the size of a neckband for securing a neckband therein adjacent an upper portion thereof,

an upper clamp defining a clamp opening therein substantially equal to said opening of said gauge and aligned therewith, means movably disposing said upper clamp above said gauge and said upper clamp constituting a clamping means with said gauge for clamping therebetween a tie at a neck area thereof adjacent the neckband,

a clamp and cutting blade carrier means for clamping and cutting, respectively, an upper needle thread,

said upper clamp including guide means for guideably mounting said clamp and cutting blade carrier means for movement of the latter upon actuation thereof into a withdrawn position under said upper clamp, as well as into an operative position projecting into said clamp opening,

pneumatic actuating means constituting a pneumatic cylinder operatively mounted on said upper clamp moveably jointly therewith, and for actuating said clamp and cutting blade carrier means.

3,981,255

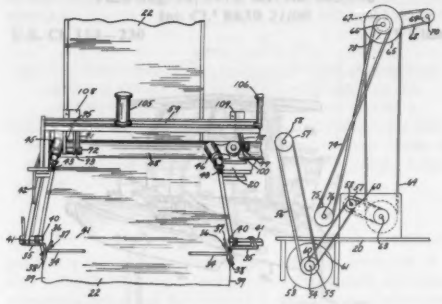
CURTAIN HEMMING DEVICE

Hervey Taylor, Candor, N.C., assignor to Home Curtain Corporation, Far Rockaway, N.Y.

Filed May 27, 1975, Ser. No. 580,763
Int. Cl.² D05B 25/00
U.S. Cl. 112—155 3 Claims

1. In a device for forming a hemmed edge on each side of a continuous web of material, said device including a main frame element having a principal longitudinal axis and a transversely extending supporting member, and first and second sewing machines positioned in the area of each hemmed edge, means for driving said first and second sewing machines in synchronism, and means for advancing said web in synchronism with said machines, the improvement comprising: one of said sewing machines being in fixed location relative to said frame element, the other of said sewing machines being selectively positionable at a plurality of locations along a transverse axis relative to said frame element; prime mover means mounted upon said frame element, a transversely extending shaft mounted for rotation upon said frame element and driven by said prime mover means; said one of said sewing machines being supported from said transversely extending supporting member, and having belt means driven from said

transversely extending shaft to oscillate stitch forming means thereon; said frame element including a second transversely extending support means, said means carrying fabric elevating means cooperating with said stitch forming means, and forming an interstice therebetween through which a web of fabric



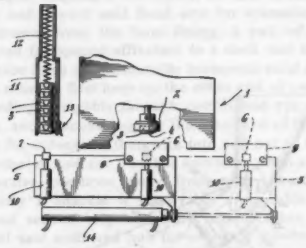
may pass; said transversely extending shaft projecting outwardly of said frame element and mounting a driven pulley, said second transversely extending support means carrying a pulley driving said fabric elevating means, there being belt means interconnecting said last two mentioned pulleys.

3,981,256

MAGNETIC AUTOMATIC BOBBIN CHANGER FOR SEWING MACHINES

William B. Sexton, Moore, S.C., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Filed May 9, 1975, Ser. No. 575,867
Int. Cl.² D05B 57/26
U.S. Cl. 112—180 **7 Claims**



1. In a lock stitch sewing machine and automatic bobbin changer, the sewing machine being provided with a conventional bobbin holder adapted to hold a bobbin and case, the case having a latch and means for holding the bobbin and case and strong detent means for holding the bobbin and case, said detent means cooperating with the latch, a sensor on the sewing machine for sensing when a bobbin is almost exhausted, said sensing means providing a signal when the approaching exhaustion of the bobbin actuates the sensor, the improvement, comprising, in combination,

a. a magazine positioned adjacent to the sewing machine adapted to hold a plurality of bobbins and cases and quick detent means,

b. a cross slide provided with a first magnet and a second magnet and actuating means for moving the magnets toward and away from the sewing machine and magazine and also actuating means for moving the slide from a first position in which the first magnet is opposite the sewing machine bobbin holder and the second magnet is opposite the magazine,

c. initiating means for the magnet and slide actuating means, said initiating means being actuated by the signal from the almost-empty bobbin holder sensor, the initiating means causing the magnet actuating means to move the first magnet toward the bobbin holder and the second magnet toward the magazine, the movement being sufficient to contact the magnets with an almost empty bobbin and case on the sewing machine and with a full bobbin and case in the magazine,

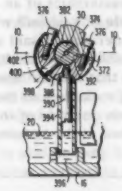
d. means for actuating the magnet moving means through a cycle after the magnets are moved toward the sewing machine and magazine by the initiating signal means, said cycle first withdrawing the magnets, the first magnet being sufficiently strong to move the latch to an unlatched position whereby the unlatched empty bobbin and case is removed from the sewing machine bobbin and case holder and the full bobbin and case is removed from the magazine, the second step in the cycle actuating the means for moving the slide to a position in which the magnet and full bobbin case are aligned with the sewing machine bobbin and case holder, the second step of the cycle moving the second magnet forward a sufficient distance to lock the full bobbin and case in the bobbin holder by means of the latch and the detent mechanism, the third step in the cycle retracting the second magnet, said magnet being insufficiently strong to unlatch the full bobbin and case, the fourth step in the cycle actuating the slide to move to the position where the first magnet is aligned with the sewing machine bobbin holder and the second magnet with the magazine.

3,981,257

SEWING MACHINE LUBRICATION SYSTEM AND PUMP THEREFOR

Edward A. Kelly, 126 Meadowgate, Wethersfield, Conn. 06109

Division of Ser. No. 354,714, April 26, 1973. This application Dec. 30, 1974, Ser. No. 537,626
Int. Cl.² D05B 71/00
U.S. Cl. 112—256 **6 Claims**



1. A pump comprising a housing having a cylindrical bore extending therethrough, an elongated shaft extending through said cylindrical bore and supporting said housing for free rotation thereon, frame means independent of said housing journalling said shaft for rotation about its longitudinal axis, first and second radial bores formed in said housing in spaced circumferential relation to one another, a plunger slidably mounted in said first radial bore, said plunger having a flat inner end surface extending in tangential contacting relation with said shaft, spring means carried by said housing and resiliently urging said plunger radially inward into said contacting relation with said shaft, a substantially arcuate circumferentially extending depressed eccentric groove formed in said shaft in the portion thereof within said cylindrical bore, said groove having an axial dimension adapted to receive the inner end of said plunger during relative rotation between said shaft and said housing, said second radial bore defining a pump inlet for supplying fluid to said cylindrical bore, means defining an outlet to permit fluid to be discharged from said pump, first restraining means normally restraining said hous-

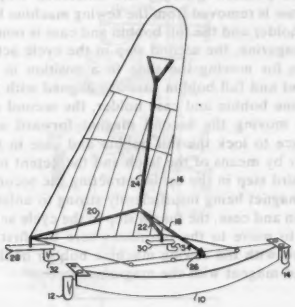
ing against rotation about the axis of said shaft, and means for rotating said shaft about its longitudinal axis in a direction to move said groove progressively past said first and said second radial bores in succession.

3,981,258

WATERSKI SAILBOAT

Bernard Smith, King George, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 15, 1975, Ser. No. 596,118
Int. Cl.² B63B *39/00*
U.S. Cl. 114—39 11 Claims



1. A hydrofoil sailboat comprising:

a slender hull one side of which is flat and the other side convexly curved to provide a hydrofoil shape to raise the sailboat at high speeds thereby reducing immersion and resistance;

at least one rudder on one end of said hull and means to control the angular movement of said rudder, said rudder being shaped with one flat side and one convexly curved side;

a sail, having the characteristics of an airfoil, spaced laterally from the flat side of said hull whereby said hull will resist side forces generated by said sail;

means for movably attaching said sail to said hull at an angle from the vertical so that the sail tilts toward the hull, the tilt of the sail being variable and the sail being movable in azimuth at least on one side of the hull; and

waterski means attached at the bottom of the sail and supporting the sail.

3,981,259

CATAMARAN WITH EXTENSIBLE HULLS

William H. Harper, Jr., 5125 Lake Wheeler Road, Raleigh, N.C. 27603

Filed July 7, 1975, Ser. No. 593,480
Int. Cl.² B63B *1/00*
U.S. Cl. 114—61 12 Claims

1. A boat structure comprising:

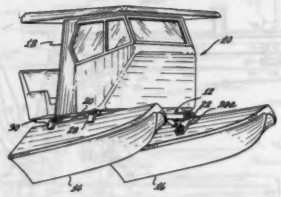
a. a frame having a spaced pair of shafts interconnected by at least a pair of transverse beams;

b. a superstructure mounted atop said frame;

c. a pair of hulls each pivotably connected to a different one of the shafts of said frame for rotation about the longitudinal axes thereof, said hulls laterally pivotable in opposite directions from a retracted position to a midposition to a fully extended position; and

d. actuatable hull pivoting means on said frame and connected to said pair of hulls for movement of said pair of hulls from the retracted to the midposition thereof and from the midposition to the fully extended position, said actuatable hull pivoting means comprising,

first selectively actuatable means on said frame and connected to said pair of hulls for movement thereof through approximately 45° of rotation about their respective ones of the shafts of said frame to move said pair of hulls from the retracted position to the midposition thereof, and



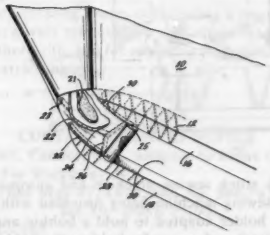
second selectively actuatable means on said frame and connected to said pair of hulls for movement thereof through approximately 45° degrees of rotation about their respective ones of the shafts of said frame to move said pair of hulls from the midposition to the fully extended position thereof.

3,981,260

ROLLER LIP SEAL FOR SURFACE EFFECT SHIPS

Jack H. Hilbig, Chula Vista, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Continuation of Ser. No. 534,717, Dec. 20, 1974, abandoned.
This application Aug. 21, 1975, Ser. No. 606,683
Int. Cl.² B63B *1/36*
U.S. Cl. 114—67 R 7 Claims



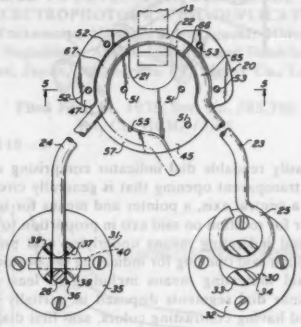
1. In a surface effect ship of a type which comprises vertically depending sidewalls defining a cavity to receive sea wave shocks, a compound keel means which comprises keel skeletal structure means pivotally mounted to the bow of the ship, a resilient shock modulating skin having a sealed attachment to said bow on a portion of said vertically depending sidewalls and connected to and enclosing said skeletal structure, a trailing means connected to the trailing edge of said skin for free movement between said vertically depending sidewalls, said trailing means adapted to smooth out the waves and reduce the drag on the keel and an air bag confined by said cavity and said keel means for biasing said keel toward the sea waves.

3,981,261

BOAT DOCKING DEVICE

Andrew G. Kauffman, 212 Heather Road, Upper Darby, Pa. 19082, and James D. Michelson, 17 Scarlet Ave., Greenridge, Pa. 19014

Filed Aug. 18, 1975, Ser. No. 605,590
Int. Cl.² B63B 21/00
U.S. Cl. 114—230 9 Claims



1. A boat docking device comprising a hub having a cut-out for receiving a boat fitting, a fixed arm having one end fixedly connected to said hub and having its other end extending outwardly therefrom, a shiftable arm having one end shiftably connected to said hub and having its other end extending outwardly therefrom and movable toward and away from said fixed arm, a bolt connected to said shiftable arm for extensile and retractile movement therewith into and out of said cut-out upon respective movement of said shiftable arm away from and toward said fixed arm for extension through and withdrawal from the boat fitting, a pair of eye members adapted for spaced affixation to a dock and each having an aperture fixed in substantially horizontal axial alignment with each other, a first loop on the other end of one of said arms extending swingably through one of said eye member apertures, and a second loop on the other end of the other of said arms for movement therewith into and out of alignment with the other of said eye member apertures when said arms are in respective positions away from and toward each other, whereby a shackle is removably engageable through said aligned second loop and other eye member to removably mount said arms and hub for swinging movement about the axis of said eye member apertures.

3,981,262

WATER JET PROPULSION APPARATUS

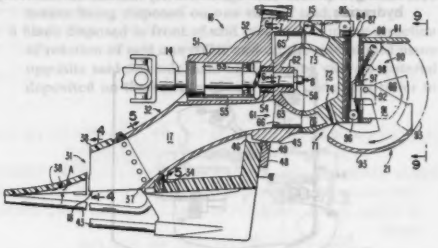
Robert DeVault, Malibu, and Ralph Maloof, Woodland Hills, both of Calif., assignors to Sidewinder Marine, Inc., Redding, Calif.

Filed Jan. 22, 1971, Ser. No. 108,946
Int. Cl.² B63H 11/10
U.S. Cl. 115—12 R 5 Claims

1. A water jet propulsion apparatus for water craft comprising:

a water-conveying conduit having an inlet opening substantially flush with the bottom of the craft and an outlet opening at the aft end of the craft and a pump within said conduit for discharging water as a propulsion jet through said outlet opening,

said inlet opening substantially in the shape of an isosceles triangle with the base of the triangle substantially straight and transverse of the length of the craft and with the apex of the triangle aligned toward the fore end of the craft, said conduit including a ramp wall extending upwardly aft from the apex of said inlet opening at an angle of less that 20°.

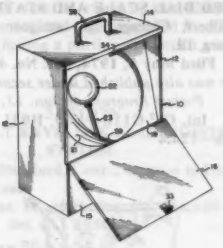


3,981,263

BLINKING REFLECTOR SIGNAL DEVICE

Eugene G. Capucio, P.O. Box 1087, Caracas, Venezuela

Filed Apr. 8, 1974, Ser. No. 458,503
Int. Cl.² E01F 9/10
U.S. Cl. 116—63 P 15 Claims



1. A blinking light reflector comprising:

a. a housing;

b. a directional light reflector surface within said housing;

c. a luminescent member;

d. oscillating means for periodically moving said luminescent member at regular intervals toward and away from said reflector surface;

e. opening means in said housing for exposing said surface and said luminescent member to an external light source; and

f. said reflector surface being a highly polished concave surface and shaped for magnifying the luminsecent member at each movement of said member toward the reflector surface such that an intermittent flashing is produced by a change in magnification as said luminescent member is moved toward and away from said reflector surface.

3,981,264

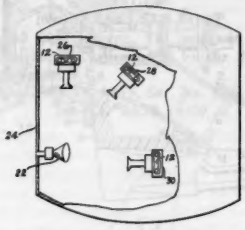
DROPLET IMPACT RECORDER

Charles A. Smith, Fountain Valley, and Arthur D. Warren, Los Angeles, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 16, 1975, Ser. No. 541,483
Int. Cl.² G01N 33/22; G03C 1/74
U.S. Cl. 116—114 AM 2 Claims

1. A method for recording the droplet fallout distribution pattern of an unreacted monomethyl hydrazine fuel component emanating from the exhaust source of a rocket propulsion motor in a closed testing environment which comprises the steps of:

a. providing a photographic film base in the testing environment having a silver alloy particle containing gelatin coating on at least one surface thereof, said particles having a predetermined sensitivity toward monomethyl hydrazine;



b. exposing at least a portion of said one surface of said coated photographic film base to the impact of said droplet fallout for a period of time sufficient to record and retain an exact droplet pattern of the said unreacted monomethyl hydrazine fuel component.

3,981,265

COMBINED DIAL SCALE AND STATION INDICATOR

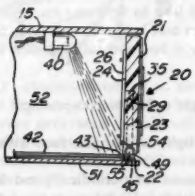
Paul B. Gilbert, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 6, 1974, Ser. No. 467,412

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.[2] G11B *31/00*; H03J *01/04*

U.S. Cl. 116—124.4 14 Claims



1. In a radio receiver and magnetic tape player combination having a radio tuning control mechanism for controlling the frequency to which the radio receiver is tuned, and a housing provided with an opening to receive a magnetic tape cartridge, the combination including:

a door having indicia thereon to indicate the frequency to which the radio receiver is tuned, said door being mounted in the housing and movable between a first position wherein the opening is closed and a second position clear of the opening to prevent entry of a cartridge;

a pointer movably mounted in the housing and operatively connected to the radio control mechanism, said pointer having a reflecting surface thereon;

reflection means including an angled reflecting surface provided in said door in position adjacent said indicia on said door for cooperating with the reflecting surface on said pointer; and

illumination means mounted in the housing for illuminating the reflecting surface on said pointer such that the reflection therefrom impinges upon said reflection means to illuminate said indicia on said door when said door is in the first position to indicate the frequency to which the radio receiver is tuned.

3,981,266

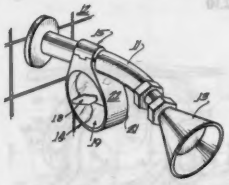
HIGH VISIBILITY DIAL INDICATOR

Russell C. Persson, 661 San Felipe St., Salinas, Calif. 93901

Division of Ser. No. 483,217, June 26, 1974, Pat. No. 3,924,468. This application Sept. 29, 1975, Ser. No. 617,484

Int. Cl.[2] G01D *13/04*

U.S. Cl. 116—129 F 2 Claims



1. An easily readable dial indicator comprising a housing defining a transparent opening that is generally circular with respect to a central axis, a pointer and means for supporting said pointer for rotation on said axis in proportion to a varying quantity, and indicating means underlying said pointer and visible through said opening for indicating the position of said pointer, said indicating means including at least first and second planar dial segments disposed in partially overlying relation and having contrasting colors, said first dial segment having a diametrically extending slot therein to form a first portion on one side of the slot and a second portion on the other side of the slot, said second segment having a sector shaped excision bounded by a generally radially extending edge, said second segment being disposed in said slot so that a portion of said second segment underlies said first portion and is obscured by said first portion of said first segment and another portion of said second segment overlies said second portion and is visible through said opening so that said edge defines a boundary between said segments, said pointer being opaque and having a circumferential extent of at least about 18° at the widest portion to afford visibility thereof under impaired visual conditions, said edge being of sinusoidal shape having a peak and a valley that are circumferentially spaced from one another by an amount exceeding the circumferential extent of said pointer so as to afford a continuous indication of the position of said pointer relative said segments, at least said second segment being moveable in said housing to permit selective position of said edge.

3,981,267

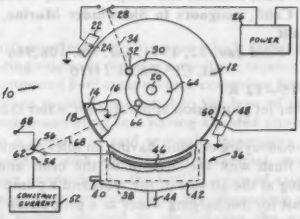
ELECTROPHOTOGRAPHIC LIQUID DEVELOPING SYSTEM

Kenneth W. Gardiner, Menlo Park, and Louis F. Schaefer, Palo Alto, both of Calif., assignors to Savin Business Machines Corporation, Valhalla, N.Y.

Filed May 20, 1975, Ser. No. 579,330

Int. Cl.[2] G03G *15/10*

U.S. Cl. 118—7 23 Claims



1. Apparatus for developing a latent electrostatic image carried by the surface of a photoconductor having a residual

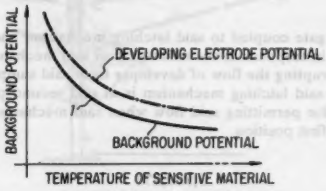
potential in background areas of said image including in combination, means for applying developer to said surface at a developing station, a development electrode at said station, a constant current source, and means for connecting said constant current source to said electrode to overcome the effect of said residual potential.

3,981,268

DEVICE FOR CONTROLLING ELECTRIC POTENTIAL APPLIED TO DEVELOPING ELECTRODE IN AN ELECTROPHOTOGRAPHIC DUPLICATOR

Takuzo Tsukamoto; Mitsuharu Nakaguchi; Hidetoshi Kito; Toshio Nagashima; Akihiko Shirata, and Shinichi Tsuda, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed June 11, 1975, Ser. No. 585,780
Int. Cl.² G03G *15/08*
U.S. Cl. 118—8 4 Claims



1. A device for use in an electrophotographic duplicator employing a sensitive member comprising a temperature-dependent sensitive material whose static charge characteristic varies with the surface temperature thereof, said sensitive member bearing an electrostatic latent image having an image region and a background region, said device comprising

a developing electrode disposed at the periphery of said sensitive member for effecting uniform development of said image region;

temperature sensitive means disposed in the vicinity of said sensitive member responsive to said surface temperature of the sensitive member for generating a bias potential for said developing electrode, said developing electrode being so controlled by said bias potential that said bias potential is always maintained at a value greater than the value of the potential of said background region even when the temperature at the surface of said sensitive material decreases substantially thereby necessitating a substantial increase in the bias potential

whereby little, if any, toner is deposited on said background region to thereby lessen fogging thereof.

3,981,269

FIXING DEVICE FOR ELECTROPHOTOGRAPHIC DUPLICATING MACHINES

Kenichi Watahiki, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1975, Ser. No. 546,762
Claims priority, application Japan, Mar. 20, 1974, 49-31159[U]
Int. Cl.² G03G *15/20*
U.S. Cl. 118—60 4 Claims

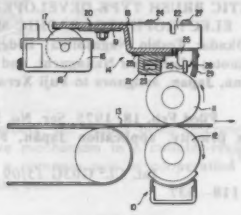
1. A fixing device for use in electrophotographic copying machine, said fixing device comprising

rollers through which is fed a copy medium supporting a toner image, one of said rollers being an image-side heat roller for fixing said toner image to support medium, said one roller having a substantially vertical imaginary plane extending through the axis thereof;

means for rotating said one roller in a predetermined direction;

feed means for applying an offset preventing solution to at least the surface of the image-side heat roller, said feed means being disposed on one side of said plane;

a blade disposed in front of said feed means in the direction of rotation of said one roller and on the side of said plane opposite said one side, said blade wiping viscous material deposited on the surface of said image-side heat roller to



thereby prevent said viscous material from reaching said feed means;

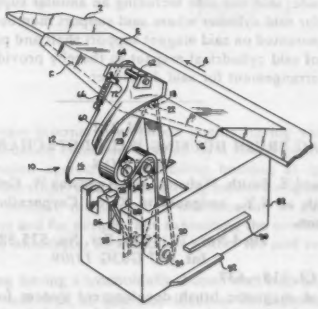
moisture absorbent means disposed in front of said blade in the direction of rotation of said one roller, said moisture absorbent means preventing flow around said image-side roller of viscous material wiped by said blade and being disposed adjacent to and slightly spaced from said image-side roller and having a portion in contact with said feed means.

3,981,270

ENDLESS BELT ENVELOPE FLAP MOISTENING SYSTEM

John J. Bogdanski, Stamford, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Mar. 10, 1975, Ser. No. 556,680
Int. Cl.² B05C *1/14*
U.S. Cl. 118—257 9 Claims



1. A moistening system for moistening the gummed flaps of envelopes processed in an envelope handling machine such as a postage meter mailing machine comprising:

a liquid reservoir means for containing a supply of liquid;

an endless belt means capable of transferring moisture extending outward from the reservoir means;

a support means for operatively movingly carrying the endless belt means, and

a contoured finger means operatively associated with the support means positioned adjacent to the endless belt means;

the contoured finger means and the endless belt means defining between them, upon insertion of an envelope

flap therebetween, an area for receiving the gummed flap of an envelope;

the contoured finger means being so shaped and positioned relative to the endless belt means as to apply pressure against at least a portion of a flap inserted therebetween in such a manner that the gummed edge portion of the envelope flap contacts the endless belt means to receive moisture therefrom.

3,981,271

MAGNETIC BRUSH TYPE DEVELOPER FOR USE IN AN ELECTROPHOTOGRAPHIC MACHINE

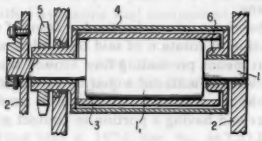
Ryuzo Okada; Toshio Nagashima; Hidetoshi Kito; Takuzo Tsukamoto; Michiharu Nakaguchi, and Kenichi Handa, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1975, Ser. No. 550,562

Claims priority, application Japan, Feb. 20, 1974, 49-19615[U]

Int. Cl.[2] G03G *15/09*

U.S. Cl. 118—637 3 Claims



1. A magnetic brush developer for use in electrophotographic copiers or the like, said developer comprising

a magnet support shaft fixedly mounted with respect to said copier;

a hollow, cylindrical magnet fixedly mounted on said support shaft;

a hollow cylinder rotatably, concentrically mounted about said cylindrical magnet, said cylinder having at least one side, said one side including an annular support member for said cylinder where said support member is rotatably mounted on said magnet support shaft and projects inside of said cylindrical magnet to thereby provide a compact arrangement for said developer.

3,981,272

MAG BRUSH HOUSING WITH DETACHABLE SUMP SECTION

Richard E. Smith, Webster, and Augustus W. Griswold, Rush, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 20, 1974, Ser. No. 525,528

Int. Cl.[2] G03G *13/09*

U.S. Cl. 118—637 12 Claims

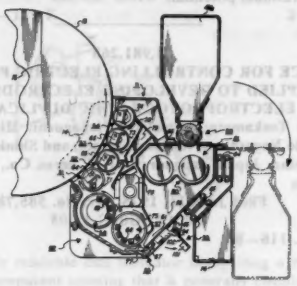
1. A magnetic brush development system for developing latent electrostatic images carried by a substrate; said system having a split housing comprising

a stationary section positioned adjacent said substrate and including at least one development roll spaced a predetermined distance from said substrate for brushing said substrate with developer;

a movable section located outboard of said stationary section, said movable section being mounted for movement relative to said stationary section and including a sump for storing a supply of developer, said sump having a discharge orifice

means for moving said developer along a flow path from said sump, through said orifice to said roll and back to said sump;

a latching mechanism operative in a first position to secure said movable section to said stationary section and operative in a second position to release said movable section from said stationary section; and



a flow gate coupled to said latching mechanism and movable in response to the movement of said mechanism for interrupting the flow of developer from said sump whenever said latching mechanism is in said second position and for permitting said flow when said mechanism is in said first position.

3,981,273

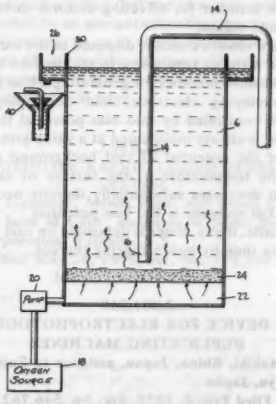
FISH HUSBANDRY SYSTEM

Keen W. Buss, 967 Wall Station, Boalsburg, Pa. 10005

Division of Ser. No. 405,633, Oct. 11, 1973, abandoned, which is a division of Ser. No. 162,910, July 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 16,830, March 5, 1970, abandoned. This application Dec. 20, 1974, Ser. No. 534,923

Int. Cl.[2] A01K *63/00*

U.S. Cl. 119—3 2 Claims



1. Apparatus for the intensive raising of fish for human consumption in a controlled environment comprising a tank adapted to contain water for the raising of said fish, water supply means for delivering water into said tank adjacent a porous plate positioned above a bottom thereof for distributing incoming water over the same and for conducting water through said tank from bottom to top in a substantially uniform upward direction across the width of said tank at a velocity of at least one foot per minute sufficient to move substantially all solid waste matter in an upward direction to the upper

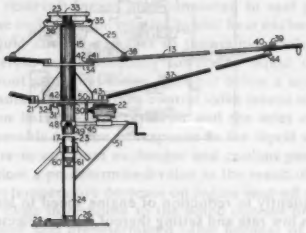
region of said tank, an external peripheral trough adjacent the upper edge of said tank for receiving and discharging the overlow from said tank including said solid waste matter and an aeration means connected with the tank below the porous plate for introducing oxygen into the water being supplied to said tank to maintain the oxygen level in said water at about the saturation level and aid in the upward flow and removal of waste.

3,981,274

HORSE WALKER HAVING A CONTINUOUSLY VARIABLE TRANSMISSION AND FOLDING BOOMS

Terry W. Curtis, R.R. No. 1, Box 45, Albany, Ill. 61230

Filed July 31, 1975, Ser. No. 600,261
Int. Cl.² A01K *15/00*
U.S. Cl. 119—29 **7 Claims**



1. A horse walker comprising:
an upright standard,
a driven wheel having a hub rotatively mounted on said standard for rotation of said driven wheel in a horizontal plane, said driven wheel having a horizontal annular surface about said standard, said annular surface having substantial radial width,
a boom,
means for fastening one end of said boom to said hub, said boom extending radially from said hub for rotation therewith,
a motor having a drive wheel with a driving circumferential surface,
means for mounting said motor to position said driving circumferential surface in firm contact with said horizontal annular surface, the direction of the axis of said drive wheel being radial with respect to the hub of said driven wheel,
means for moving at will said motor radially with respect to said hub to move said drive wheel inwardly and outwardly across said horizontal annular surface such that said drive wheel and said driven wheel cooperate to function as a continuously variable transmission between said motor and said boom.

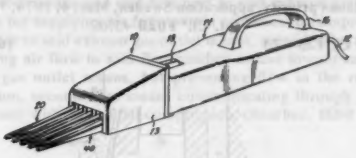
3,981,275

DOG GROOMING TOOL

Louis C. Schimoler, 1639 Cedar Swamp Road, Brookville, Glen Head PO, N.Y. 11545

Filed June 20, 1975, Ser. No. 588,622
Int. Cl.² A01K *13/00*
U.S. Cl. 119—83 **5 Claims**

1. A power operated grooming tool for splitting matted hair in aimals while minimizing the cutting of said hair comprising an elongated housing having a longitudinal axis, a forward portion and a rearward portion; means defining an opening in the forward portion of said housing; an electric motor in said rearward portion connected to a source of power; a reciprocating drive mechanism in said forward portion of said housing connected to said motor; an elongated comb member extending from the forward portion of said housing having a plurality of grooved teeth members, said grooved teeth being adapted to partially enclose and guide a series of reciprocating blades, said blades having cutting edges exposed above the



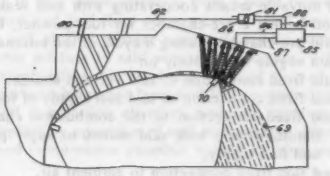
grooved teeth members, the blades being operatively connected to the drive mechanism in a counter-reciprocating relationship along a common axis in cooperation with the teeth members of the comb.

3,981,276

INDUCTION-EXHAUST SYSTEM FOR A ROTARY ENGINE

Robert P. Ernest, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 6, 1974, Ser. No. 476,833
Int. Cl.² F02B *53/00*
U.S. Cl. 123—8.45 **14 Claims**

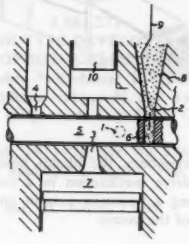


1. In a rotary internal combustion engine having variable volume combustion chambers defined by a rotary piston dynamically sealed against a surrounding housing at spaced locations of the rotor, said engine having means for igniting a combustible mixture introduced at one location to each of said chambers and for peripherally exhausting the combustion gas from said chambers, an induction system for said engine, comprising:
a. a housing having a trochoidally shaped wall with an inlet port in said wall at said one location for admitting a combustible mixture into said chambers, said port having a centerline located at a station of said wall wherein the differential pressure between adjacent chambers will be consistently at about 0, said port having a throat area equal to or less than 1.0 square inch for each 42 cubic inches of engine displacement whereby induction flow velocity is induced at a high level, and
b. means effective to permit flow of said combustible mixture through said port while limiting dilution backflow to less than 2 cubic inches per cycle of said engine, said means being actuated to open or close by a change in direction of greatest fluid pressure forces in said inlet port, said means having a frequency response of at least 120 cycles/second.

3,981,277
SOLID FUEL INJECTION APPARATUSES

Jan Viktor Åbom, Poppelgatan 12, 421 74 Västra Frölunda, Sweden

Filed Feb. 18, 1975, Ser. No. 550,640
Claims priority, application Sweden, Mar. 4, 1974, 7402810
Int. Cl.² F02B 45/02
U.S. Cl. 123—23 10 Claims



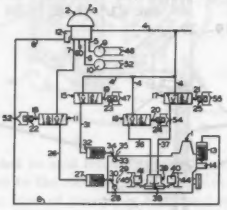
1. An apparatus for injecting pulverulent fuel into the combustion chamber of an internal combustion engine comprising
a fixed connection to the combustion chamber;
a vacuum source having a fixed connection attached thereto;
a fuel supply of fuel powder having a fixed connection attached thereto;
means to apply pressure to said fuel supply having a fixed connection attached thereto;
a fixed connection to ambient air;
sealing means having means to apply said sealing means under pressure;
and movable means cooperating with said sealing means and having a pre-chamber for fuel powder, to connect said pre-chamber during a cycle of the internal combustion engine successively to:
said fixed connection to said vacuum source,
said fixed connection to said fuel supply of fuel powder,
said fixed connection to the combustion chamber and simultaneously with said means to apply pressure to said fuel supply,
and said fixed connection to ambient air,
while said means to apply said sealing means under pressure applies said sealing means sealingly against said movable means to seal said pre-chamber attachment with each of said fixed connections,
whereby said pre-chamber successively has a vacuum therein from its said connection to said vacuum source, has fuel powder fed therein by the action of the vacuum prevailing therein, has fuel powder injected into said connection to the combustion chamber by the action of pressure placed on the fuel from said connection from said means to apply pressure to said fuel supply, and has lowered pressure by said connection to ambient air.

3,981,278
PROTECTION APPARATUS FOR REMOTELY CONTROLLED SELF-REVERSING MARINE ENGINES

Noboru Harada, Mihara, Japan, assignor to Mitsubishi Heavy Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 399,559, Sept. 21, 1973, abandoned.
This application Feb. 6, 1975, Ser. No. 547,452
Int. Cl.² F01L 13/02
U.S. Cl. 123—41 R 8 Claims

1. Protection apparatus for remotely controlled reversible marine engines for marine vessels including drive means therefor, engine starting means, speed control means, an operator's controller selectively operable to a plurality of forward or reverse positions for effecting forward or reverse travel, engine starting and speed of the vessel according to the controller position selected, and control means operable responsively to operation of said operator's controller to a selected position, said control means including:
a. first means actuable responsively to operation of said operator's controller from any one of said plurality of forward or reverse positions to a selected opposite position for reversing engine rotation by sequentially shutting down the engine, reducing the rotational speed thereof, and setting the engine for forward or reverse rotation according to the position selected;
b. second means actuable responsively to actuation of said first means, with said operator's controller remaining in said opposite position, for effecting engine restarting

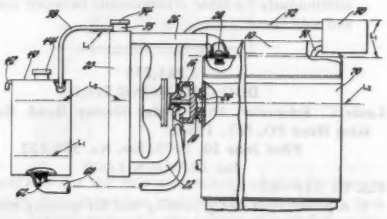


subsequently to reduction of engine speed to less than a certain low rate and setting thereof for the selected direction of rotation;
c. third means actuable responsively to actuation of said first and second means for effecting engine speed according to the selected opposite position of the operator's controller subsequently to said engine restarting,
and wherein the improvement comprises:
d. fourth means for delaying said engine restarting and consequent reversal of direction of travel of the vessel until engine speed has reduced to said certain low rate, notwithstanding operation of said operator's controller from one of said forward or reverse positions directly to said opposite position without delay.

3,981,279
INTERNAL COMBUSTION ENGINE SYSTEM

William C. Bubniak, Troy; Edward D. Klomp, Mount Clemens; William R. Matthes, Troy, and Neil A. Schilke, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 26, 1975, Ser. No. 608,013
Int. Cl.² F01P 3/20
U.S. Cl. 123—41.14 2 Claims



1. An internal combustion engine system characterized by rapid combustion chamber surface temperature increase on cold start comprising in combination:
an internal combustion engine having at least one combustion chamber and liquid coolant passages about said chamber to cool same during normal engine operation;

a heat exchanger connected to receive liquid coolant from and after cooling return the liquid coolant to said liquid coolant passages;

a pump means driven by said engine for circulating liquid coolant through said liquid coolant passages and heat exchanger;

a thermostat control valve means for controlling liquid coolant flow from said liquid coolant passages to said heat exchanger wherein flow is blocked when the engine is cold and flow is permitted at an increasing rate with increasing liquid coolant temperature as engine temperature increases;

a reservoir means having an atmospheric vent;

a pressure regulator means for regulating the pressure of the circulating liquid coolant and delivering the overflow to said reservoir;

a vent valve means for venting said heat exchanger and liquid coolant passages to said reservoir;

said reservoir means also connected to said pump and of size and elevation relative to said heat exchanger and said liquid coolant passages so that liquid coolant can drain thereto to substantially lower the liquid coolant level about said combustion chamber below a normal level;

pressure responsive flow control valve means in the connection between said reservoir and the inlet of said pump operable to open in response to the liquid coolant pressure in said heat exchanger and coolant passages falling below a predetermined value as the result of liquid coolant temperature decrease on engine shut-off and operable to close in response to the liquid coolant pressure rising above said predetermined value because of temperature increase after cold engine start providing means whereby liquid coolant drains to said reservoir to establish a below-normal liquid coolant level about said combustion chamber when the engine is cold and is pumped back into said heat exchanger and liquid coolant passages on cold start to establish the normal liquid coolant level which is thereafter maintained for normal engine cooling;

and orifice means of predetermined size in bypass relationship wth said thermostat control valve for operating when the thermostat control valve is closed on cold engine start to vent said liquid coolant passages at a limited rate to prolong the change from the below-normal to normal liquid coolant level for a predetermined substantial time period during cold start operation providing means whereby normally liquid cooled portions of said combustion chamber are not cooled until a substantial time period after cold start.

3,981,280
TWO-STROKE COMBUSTION ENGINES

Walter Franke, Hittfelder Kirchweg 22, 2105 Seevetal 3, Germany

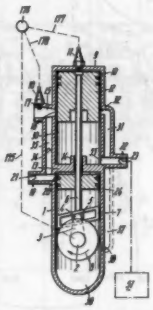
Filed Feb. 19, 1974, Ser. No. 443,922

Claims priority, application Germany, Feb. 19, 1973, 2308127

Int. Cl.² F02B *1/08*

U.S. Cl. 123—69 R **7 Claims**

1. A two-cycle internal combustion engine comprising a working cylinder, a working piston operating within said working cylinder, a combustion chamber defined within said working cylinder on one side of said working piston, a partition wall forming a side of said working cylinder, a first compression chamber defined between the opposite side of said working piston and one side of said partition wall, a piston rod connected with said working piston and extending through said partition wall, a compression piston connected with said piston rod on the side of said partition wall opposite said first compression chamber, a second compression chamber defined between one side of said compression piston and said opposite side of said partition wall, exhaust gas outlet means for exhausting gas from said combustion chamber, first inlet means communicating through a first inlet port with said second compression chamber for supplying air thereto, first valve means between said first inlet means and said first port for enabling air flow toward said second compression chamber but blocking flow in a reverse direction, first conduit means extending in flow communication from a point between said first valve means and said first port to said exhaust gas outlet means for supplying air from within said second compression chamber to said exhaust gas outlet means, second valve means enabling air flow in said first conduit means toward said exhaust gas outlet means, but preventing flow in the reverse direction, second inlet means communicating through a second port with said first compression chamber, third valve



means between said second port and said second inlet means for enabling flow toward said first compression chamber but preventing flow in a reverse direction, second conduit means extending in flow communication from a point between said second port and said third valve means to said combustion chamber and air-fuel mixture supply means for supplying a combustible mixture to said second inlet means, with compressed combustible mixture being supplied through operation of said working piston from said first compression chamber to said combustion chamber, and with compressed air being supplied by operation of said compression piston from said second compression chamber to said exhaust gas outlet means.

3,981,281
CAM FOR CONTROLLING VALVES OF AN INTERNAL COMBUSTION ENGINE

Gerhard Deschler; Dieter Wittmann, and Reinhold Trier, all of Nurnberg, Germany, assignors to Maschinenfabrik Augsburg-Nurnberg AG, Nurnberg, Germany

Filed June 20, 1975, Ser. No. 588,968

Claims priority, application Germany, June 20, 1974, 2429708

Int. Cl.² F16H *53/00*

U.S. Cl. 123—90 6 **1 Claim**

1. For use in connection with a valve, with spring means continuously urging said valve into its closing position, and with a tappet having a flat bottom for opening said valve against the thrust of said spring means, a rotatable cam operable to be accelerated and decelerated, in which the acceleration and deceleration phases are divided into a total of five phase I to V, and in which the acceleration phases I and V of the opening and closing flank are determined by a Fourier series of third order by the following equation:

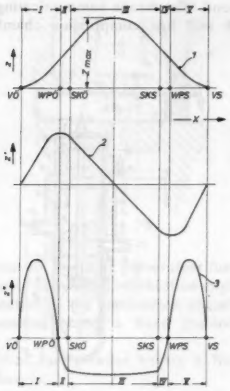
$$z_j = a_j \cdot \sin\alpha + a_j \cdot \sin 2\alpha + a_{j3} \cdot \sin 3\alpha$$

where j indicates the relevant phase I or V, the values a_j to a_j are selected according to the specified conditions, and α represents a function of the cam angle x, and in which phase II following the opening flank is characterized by the equation:

$z_{II} = a_4 \sin[\sqrt{0.5}(x-WP\ddot{O})]-SK(x-WP\ddot{O})+z_{A\ II}$

and together with the phase IV of the deceleration phase before the closing flank bring about an axially constant increase in the lubrication number curve, said phase IV being characterized by the equation:

$z_{IV} = a_7 \sin[\sqrt{0.5}(x-SKS)]+a_8\cos[\sqrt{0.5}(x-SKS)]+SK(x-SKS)+z_{A\ IV}$



The values a and z_A resulting from the continuity of the lift curve z and the first and second derivation z',z'' with respect to the cam angle x, WPO being the reversal point at the cam lift on the opening side, SK representing the ascent value and SKS the start of the constant drop in the lubrication number at the closing side, and in which in phase III in the range of highest deceleration a constant lubrication number is attained which is determined by the correlation to the cam lift

$z_{III}=a_6 \sin[\ 0.5(x-SKO)]+a_6\cos[\ 0.5(x-SKO)]+Smax+RG,$

SKO being the end of the constant cam rise, $Smax$ representing the maximum lubrication number value, and RG representing the cam base circle radius.

3,981,282

IGNITION SYSTEMS AND FUEL INJECTION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Eric Harold Ford, London, England, assignor to Lumenition Limited, England

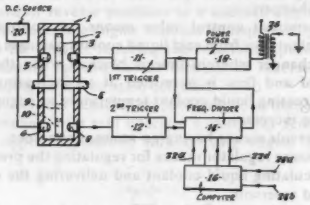
Filed Jan. 8, 1973, Ser. No. 321,660

Claims priority, application United Kingdom, Jan. 18, 1972, 2311/72

Int. Cl. F02p *5/04, 1/00*

U.S. Cl. 123—117 R **10 Claims**

1. An electronic device for controlling the advance and retard of the ignition timing of an internal combustion engine in accordance with engine requirements, including means for generating a first series of square-wave voltage pulses in synchronism with the engine revolutions to provide a series of alternate first and second voltage levels; means for generating a second series of square-wave voltage pulses also in synchronism with the engine revolutions and at a fixed multiple of the first series of square-wave voltage pulses, so that the frequency of the second series of voltage pulses is greatly in excess of the frequency of the first series of voltage pulses; means for counting a number of the second series of voltage pulses from a predetermined point in relation to the first series of voltage pulses, the number of said pulses counted depending on the engine requirements; means for producing an output at the first voltage level from said counting means after said count has been completed; means for detecting the presence of both an output at the first voltage level from the first pulse generating means, and an output at the first level from



the counting means in order to initiate the production of a spark for the combustion of the fuel; and means for continuously varying the count of the counting means, so as to advance and retard the ignition timing in accordance with the requirements of the engine.

3,981,283

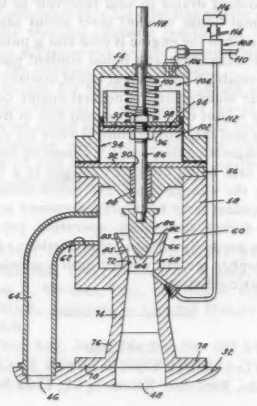
ENGINE EXHAUST GAS RECIRCULATING CONTROL

Warren F. Kaufman, Santa Ana, Calif., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 3, 1974, Ser. No. 502,523

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **7 Claims**



1. An exhaust gas recirculating flow metering control for an internal combustion engine having a duct connecting engine exhaust gases to the engine intake manifold, the control including a movable valve means associated with the duct and postioned to normally close the duct to prevent recirculation of the exhaust gases and movable to open positions to permit variable recirculation of the gases, and spring means biasing the valve means towards a duct closing position, the valve means including sonic flow metering means which in each open position of the valve means maintains flow past the valve means at a constant rate independent of the pressure variation in the duct downstream of the valve means, and actuator means connected to the valve means and movable in response to predetermined conditions of operation of the engine to move the valve means to a different open piston to change the rate of flow of exhaust gases into the intake manifold, the valve means including a sonic flow nozzle having a contoured pintle mounted therein, means mounting the nozzle and pintle for a relative axial movement therebetween the closed and

open pistons of the valve means, the nozzle and pintle being so constructed and arranged as to define in the open positions of the valve means first a converging flow area between the nozzle and pintle followed by a gradually diverging flow area between the nozzle and pintle progressively expanding the flow gradually into the duct downstream of the nozzle and pintle to minimize flow losses and maintain sonic flow in the nozzle, the relative movement between the nozzle and pintle providing varying converging-diverging annular flow areas between the nozzle and pintle, the nozzle and pintle being so contoured and proportioned as to impart sonic velocity to the flow through the nozzle over essentially the entire operating range of the engine manifold vacuum.

3,981,284
CARBURETOR

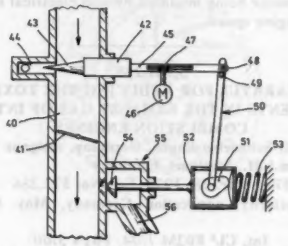
Reinhard Gospodar, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

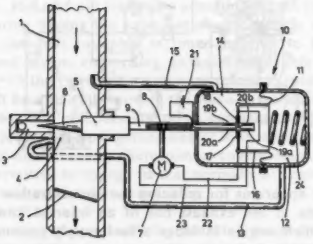
Filed Nov. 15, 1974, Ser. No. 524,256

Claims priority, application Germany, Nov. 17, 1973, 2357465

Int. Cl.² F02M 9/06

U.S. Cl. 123—119 A **10 Claims**





1. In a carburetor for an internal combustion engine comprising an intake channel for the passage of air, a throttle valve arranged in said intake channel, nozzle means having an exit aperture into said intake channel for discharging fuel into said intake channel upstream of said throttle valve, and a piston valve arranged to move linearly across said intake channel, upstream of said throttle valve, and in a direction substantially transverse to the longitudinal axis of said intake channel thereby to vary the cross-sectional area of said intake channel at the region of air-fuel mixture, said piston valve having a tapered nozzle needle projecting into said exit aperture of said fuel nozzle means; the improvement comprising servo motor drive means for positioning said piston valve in said intake channel, and means for controlling said drive means in dependence upon the difference between the total pressure in said intake channel and the static pressure in said mixture region of said intake channel.

3,981,285
FUEL CONTROL SYSTEM FOR SUPERCHARGED, FUEL INJECTED INTERNAL COMBUSTION ENGINES

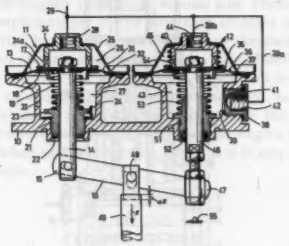
Peter Schueler, Asperg; Detlev Runge, and Heinz Kuschmierz, both of Gerlingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Continuation of Ser. No. 388,935, Aug. 16, 1973, abandoned. This application June 19, 1975, Ser. No. 588,132

Claims priority, application Germany, Aug. 19, 1972, 2240947

Int. Cl.² F02B 33/00

U.S. Cl. 123—119 C **16 Claims**



1. In a fuel control system for supercharged, fuel injected internal combustion engines employing exhaust gas turbochargers, comprising: a turbo-charged intake manifold pressure actuated first movable partition means; a setting member; and means connecting the setting member to said first partition means, said setting member being actuated by the motion of said first movable partition means and said means connecting the setting member to said first partition means for displacing said setting member in the direction of an increasing fuel supply quantity during a period of increasing turbo-charged intake manifold pressure, the improvement comprising: a supplementary pneumatic control unit having delayed feedback characteristics and including a second movable partition means, air line means positioned between the intake manifold and one side of said first movable partition means and further line means connected to one side of said second movable partition means for supplying a pneumatic control medium thereto, means for connecting said second partition means to said setting member, and both the one side of the first and the one side of the second partition means are pressure actuated by the fuel intake manifold pressure, i.e., the pneumatic control medium pressure, in the same working direction when viewing the movement of the setting member, a delay member connected to said control unit through which said control medium is supplied to the other side of said second movable partition means, by means of said control unit the position of said setting member is made to be additionally changeable, said second movable partition means being acted on by a differential pressure of the pneumatic control medium delivered through said connecting line means to the one side of said second movable partition means and through said delay member to the other side of said second movable partition means, where said pressure is a measure of the engine acceleration, whereby during periods of increasing pressure of the control medium, said second partition means and said means for connecting said second partition means to said setting member supplementarily displaces said setting member beyond the position set by said first movable partition means and in the direction of an increasing fuel supply quantity, and counter pressure means comprising said delay member for producing, during constant speed operation, a reversal of the supplementary displacement of said setting member to a zero value by the effect of an increasing counter pressure exerted by the control medium.

3,981,286

METHOD AND APPARATUS FOR FORMING AND BURNING A FUEL-AIR-MIXTURE IN AN AIR-COMPRESSING PISTON INTERNAL COMBUSTION ENGINE

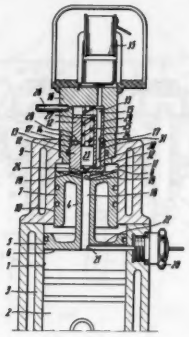
Werner Erik Siemens, Parkallee, 28 Bremen 1, Germany

Filed Feb. 3, 1975, Ser. No. 546,789

Claims priority, application Germany, Feb. 1, 1974, 2404692

Int. Cl.² F02M *49/02*

U.S. Cl. 123—139 AJ **11 Claims**



1. A method for forming and burning a fuel-air-mixture in an air compressing piston internal combustion engine comprising the steps of tapping off at least a portion of the air compressed in the combustion space of the working cylinder, passing the tapped off portion of air into a chamber which is in communication with the combustion space, injecting a measured amount of fuel through an injection nozzle into a fraction of said portion of air during its recirculation into the combustion space, accelerating said fraction of air and the injected quantity of fuel together towards the combustion space, conveying the thus formed mixture into the air present in the combustion space during combustion, adjusting the quantity of fuel injected, and adjusting the amount of said air fraction proportional to said quantity of injected fuel.

3,981,287

FUEL SYSTEMS FOR ENGINES

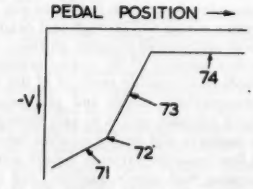
Malcolm Williams, Solihull; Richard William Crookes, Shirley, and Christopher Robin Jones, Alcester, all of England, assignors to C.A.V. Limited, Birmingham, England

Continuation of Ser. No. 446,540, Feb. 27, 1974, abandoned. This application Mar. 13, 1975, Ser. No. 558,060

Claims priority, application United Kingdom, Mar. 2, 1973, 10343/73

Int. Cl.² F02B *3/00*; F02M *39/00*

U.S. Cl. 123—139 E **6 Claims**



1. A fuel system for an engine, comprising in combination a pump supplying fuel to the engine, pump control means including a pedal for determining the output of the pump, a first summing amplifier to which are fed signals representing the demanded and actual values of pump output, said demanded value signal being proportional to the position of said pedal, together with a signal representing engine speed, the first summing amplifier comparing the signals it receives and producing an output controlling the pump control means, a second summing amplifier to which are fed electrical signals representing engine speed and a reference, and a discriminator coupling the first and second summing amplifiers to the pump control means, the output from the discriminator at any instant being the output from the summing amplifier demanding the least fuel, so that the second summing amplifier limits the engine speed, and in which the first summing amplifier limits the pump output, and in which the speed signal is fed to the first amplifier indirectly by modifying the output of a transducer measuring demanded pump output, and in which the transducer measuring demanded pump output includes an operator controlled member and associated circuit means for producing a d.c. voltage, and further including a first transistor for receiving said d.c. voltage so that the first transistor conducts increasingly with increasing demand, the first transistor being coupled to a second transistor the conduction of which decreases with increasing demand so as to provide an input to the first summing amplifier, the conduction of the second transistor being modified by said electrical signal representing engine speed.

3,981,288

APPARATUS FOR REDUCING THE TOXIC COMPONENTS IN THE EXHAUST GAS OF INTERNAL COMBUSTION ENGINES

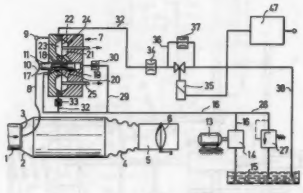
Wolf Wessel, Schwieberdingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Apr. 28, 1975, Ser. No. 572,286

Claims priority, application Germany, May 13, 1974, 2423111

Int. Cl.² F02M *1/04*; F01N *3/00*

U.S. Cl. 123—139 AW **7 Claims**



1. In an apparatus for reducing the concentration of toxic components in the exhaust has of an internal combustion engine, which engine includes a fuel supply system, a fuel metering system and a control pressure circuit for controlling said fuel metering system, said control pressure circuit including an electromagnetic valve which controls a fuel bypass, said apparatus further including a regulating device which accepts control information signals from sensors monitoring the value of engine parameters and which cyclically actuates and controls said electromagnetic valve to intermittently actuate the fluid bypass, the improvement comprising the regulating device for controlling the electromagnetic valve including:

an electric signal generator, having an output connection and generating sawtooth signals of constant frequency and amplitude;

summing amplifier means, having an inverting and a non-inverting input connection and an output connection;

first resistive means, connected to the output of said electric signal generator and connected to receive said control information signals from said sensors, and to effect electrical superposition of said sawtooth signals and said control information signals and further connected to said inverting input of said summing amplifier;

second resistive means, including too resistors connected as a voltage divider circuit and providing a predetermined voltage to said non-inverting input of said summing amplifier;

whereby signals appearing at said output of said summing amplifier mediately affect the energization timing of said electromagnetic valve, thereby changing the mass ratio of the fuel-air mixture supplied to said internal combustion engine.

3,981,289

AUTOMATIC COMPRESSION RELIEF MECHANISM FOR INTERNAL COMBUSTION ENGINES

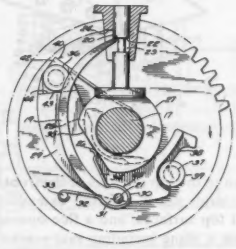
Joseph R. Harkness, Germantown, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Mar. 14, 1975, Ser. No. 558,251

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.[2] F01L *13/08*

U.S. Cl. 123—182 **9 Claims**



1. In an internal combustion engine having a valve which controls flow of gas through a port communicable with the engine combustion chamber, and valve actuating means by which the valve is moved axially between its seat and an open position, and wherein said valve actuating means comprises a valve spring biasing the valve for closing motion towards its seat, a camshaft rotatable in timed relation to the engine cycle, and means comprising an axially movable part connected with the valve and a cam constrained to rotate with the camshaft for cyclically moving the valve in the opening direction, automatic compression relief mechanism whereby the valve is prevented from getting nearer to its seat than a predetermined small distance therefrom at engine cranking speeds but is permitted to engage its seat normally at engine running speeds, said mechanism comprising:

A. a latch member;

B. mounting means confining the latch member to motion substantially transverse to the direction of movement of said part, between defined latching and inoperative positions;

C. cooperating abutment means on the latch member and on said part, engageable when the latch member is in its latching position to restrain the valve against movement through said distance to its seat, said abutment means cooperating with the valve spring and the mounting means to confine the latch member against movement out of its latching position whenever the valve actuating means tends to dispose the valve at less than said distance from its seat;

D. a cam follower movable between defined latch enabling and latch disabling positions;

E. means providing a resilient lost motion connection between the cam follower and the latch member whereby movement of the cam follower from its latch enabling position to its latch disabling position biases the latch member away from its latching position and motion of the cam follower from its latch disabling position to its latch enabling position biases the latch member away from its inoperative position; and

F. cam means cooperable with the cam follower to dispose the same in its latch enabling position only when the engine is at cranking speeds, and then only during a minor portion of the engine cycle that begins during closing motion of the valve and at a time when the valve is more than said distance from its seat, and to dispose the cam follower in its latch disabling position at all other times, said cam means comprising

1. a first cam element constrained to rotate with the camshaft and which is arranged to engage the cam follower through all but said minor portion of every engine cycle, and

2. a centrifugally responsive second cam element which is complementary to the first cam element and which is carried by the camshaft for rotation therewith and for motion relative thereto between a pair of defined positions, towards one of which it is biased and towards the other of which it is centrifugally propelled, said second cam element being arranged to engage the cam follower during said minor portion of the engine cycle, but only when said second cam element is in one of its said positions.

3,981,290

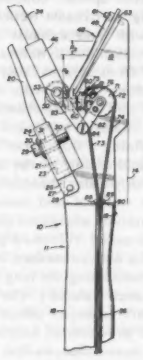
COMPOUND BOW

John J. Islas, Canastota, N.Y., assignor to Victor Comptometer Corporation, Chicago, Ill.

Filed Mar. 21, 1975, Ser. No. 560,581

Int. Cl.[2] F41B *5/00*

U.S. Cl. 124—24 R **14 Claims**



10. An archery bow comprising: a riser adapted to be grasped by an archer and having opposite, upper and lower portions; fulcrum means secured to said upper and lower portions of said riser; an elongate spring member mounted in cantilevered fashion from each said opposite portion of said riser; an upper and a lower limb element, each having an inboard end portion, a medial portion and an outboard end portion; a bow string extending between the outboard end portions of said limb elements; follower means presented from the inboard end portions of said upper and lower limb elements having a translational engagement with the fulcrum means presented from the corresponding upper and lower portions of said riser for supporting each limb element when pivoted during a cocking action; the medial portion of each said upper and lower limb elements engaging corresponding elongate spring members to cock the latter in response to the application of the drawing force to said bow string whereby

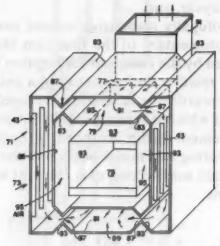
the inboard end portion, the medial portion and the outboard end portion of said limb elements are interconnected with the remainder of said bow such that the limb elements each function as a second degree lever arm.

3,981,291

HEAT TRANSFER AND CONDITIONING UNIT

Robert J. Smith, 4511 E. Snover, Silverwood, Mich. 48780

Filed May 27, 1975, Ser. No. 581,201
Int. Cl.² F24H *3/10*
U.S. Cl. 126—110 R **3 Claims**



1. A heat transfer and conditioning unit comprising a hollow casing having inner and outer walls defining exhaust passages for the conduction of products of combustion, and including at the top thereof, an exhaust inlet chamber;

and at the bottom thereof, an exhaust outlet chamber adapted for connection to a flue to atmosphere;

a hollow fire chamber spaced concentrically within said casing, and having an exhaust outlet at the top thereof communicating with said exhaust inlet; whereby, the products of combustion due to natural or other draft, pass laterally outward from said exhaust inlet chamber into said casing and along the opposite sides thereof for inward direction to said exhaust chamber;

the wall of said fire chamber as spaced from the inner wall of said casing defining a transverse fresh or ambient air passage through said casing for the transfer of heat from said walls to the air passing therethrough;

the top and bottom walls of said casing being defined by parallel spaced laterally elongated plates;

opposed inwardly directed V-formed plates at the ends of said parallel plates and connected thereto, to define in said exhaust conduits along the length thereof a series of longitudinally spaced laterally elongated venturi passages, said venturi passages effectively slowing down movement of the products of combustion through said exhaust conduits to said flue, so that increased quantities of heat are transferred to the walls thereof.

3,981,292

HEATER

Wilbur E. Lilly, and David A. Rogers, both of Mount Gilead, Ohio, assignors to Lilly Industries, Inc., Mount Gilead, Ohio

Filed July 24, 1975, Ser. No. 598,720
Int. Cl.² F24B *1/26*
U.S. Cl. 126—121 **10 Claims**

1. A heater including a front, two side walls and a rear wall joined together to form a fire box,

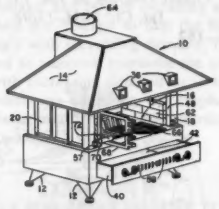
the front including a first opening for allowing the deposition of combustible material on a grate, said grate comprising a plurality of U-shaped metallic bars aligned parallel to each other and joined at their ends to straight bars extending perpendicular to said U-shaped bars, said U-shaped bars having been deformed downwardly between said straight bars to thereby define a generally wide U-shape,

means forming a rectangular horizontal opening within said fire box below the first opening in the front, the grate being supported in said opening by said straight bars resting on the means forming the rectangular horizontal opening,

a second opening in the front below the first opening, an ash pan extending through the second opening below the grate to catch falling ashes,

damper means for admitting air below the grate,

the rear wall including a vertically extending exterior panel spaced from an interior surface, said interior surface comprising three planer panels, the upper and lower of the three panels extending parallel with said exterior panel, the middle panel extending forwardly and upwardly to fill the space between the upper and lower panels,



a top attached to the top surfaces of the front, the side walls, and the exterior panel, said top extending outward and below said top surfaces, and a flue opening through the top wherein a plane including said exterior panel passes through said flue opening,

a plurality of hot air ducts extending in fluid communication through both the front and said portion of said top outward of said front from the space between the interior surface and the exterior panel of the rear wall to provide freer flow of hot air to the area to be heated and

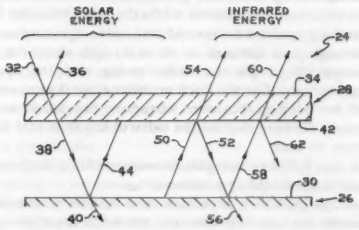
air blower means mounted on said exterior panel for moving air from outside the fire box through an aperture in the exterior panel into the space between the interior surface and the exterior panel where it may be heated and conducted through the ducts to heat the area forward of the front.

3,981,293

SOLAR HEAT COLLECTOR

Frank Howard Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 13, 1974, Ser. No. 450,702
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—271 **11 Claims**



1. A solar heat collector, comprising:

a solar and infrared energy absorber;
a cover plate capable of passing solar energy;
a coating on said cover plate to provide said cover plate with a transmittance coefficient (t) for solar radiation and a reflectance coefficient (r) for infrared energy in a wavelength range of about 2 to 15 microns wherein the product of (r) and (t) is greater than about 0.45 and wherein said coating is indium oxide, tin oxide or a mixture of tin oxide and indium oxide; and
means for mounting said cover plate in spaced relation to said absorber.

3,981,294
ALL GLASS COMPOSITE BUILDING PANELS

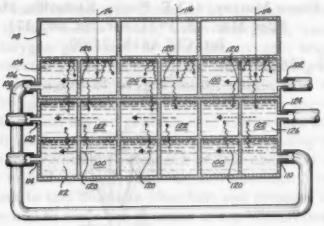
Czeslaw Deminet, Kent, and Roger B. Gillette, Auburn, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 416,539, Nov. 16, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,745

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **2 Claims**



1. An all glass building panel having a first enclosed space layer and a second enclosed space layer wherein:
a. the portion of said all glass building panel containing said first enclosed space layer comprises contiguous evacuated cells being comprised of;
a first outer glass plate,
first external glass walls fused to said first outer glass plate, one edge of said first external glass walls being fused to the circumferal edge of said first outer glass plate, said first external glass walls forming the closed external boundaries of said first enclosed space layer,
first internal glass walls fused to said first outer glass plate, one edge of said first internal glass walls being fused to said first outer glass plate within the boundaries of said first external glass walls to define the internal structure of said first enclosed space layer, and
a middle glass plate fused along its circumferal edge to the edge of said first external glass walls opposite the edge of said first external glass walls fused to said first outer glass plate and fused to the edge of said first internal glass walls opposite the edge of said first internal glass walls fused to said first outer glass plate; and,
b. the portion of said all glass building panel containing said second enclosed space layer comprises a serpentine path for liquid flow therethrough, said serpentine path having integral means for ingress and egress of liquid thereto and therefrom, said serpentine path having a membrane disposed therein for absorbing solar energy and transmitting said absorbed solar energy to the liquid disposed therein, said second enclosed space layer being comprised of;
second external glass walls fused to said middle glass plate, one edge of said second external glass walls being fused to the circumferal edge of said middle glass plate, said second external glass walls forming the closed external boundaries of said second enclosed space layer,
second internal glass walls fused to said middle glass plate, one edge of said second internal glass walls being fused to said middle glass plate within the boundaries of said second internal glass walls to define the internal structure of said second enclosed space layer, and
a second outer glass plate fused along its circumferal edge to the edge of said second external glass walls opposite the edge of said second external glass walls fused to said middle glass plate and fused to the edge of said second internal glass walls opposite the edge of said second internal glass walls fused to said middle glass plate.

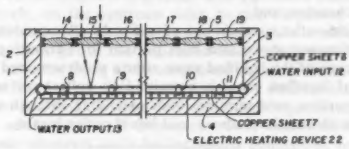
3,981,295
SOLAR HEATING SYSTEM

Jim N. Minnick, Kamiah, Idaho, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed July 15, 1975, Ser. No. 596,301

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **3 Claims**



1. A solar heating system, comprising
at least one heating unit comprising an insulated housing having a plurality of sides, a bottom and a transparent top, a pair of copper sheets at the bottom of the housing, a plurality of spacers between the copper sheets maintaining said sheets in spaced substantially parallel relation less than half an inch from each other, water input means for supplying cold water to the space between the copper sheets, water output means for withdrawing heated water from the space between the copper sheets, and lens means in the housing at the top thereof for magnifying and concentrating the rays of the sun on the copper sheets to heat the water between said sheets;
electric heating means directly beneath the copper sheets in the housing for heating the water between the copper sheets;
a source of electrical energy;
photosensitive switch means; and
circuit means electrically connecting the heating means, the source of electrical energy and the switch means in circuit in a manner whereby the water is heated by the heating means under the control of the switch means when the sunlight is beneath a predetermined brightness level.

3,981,296
SNOW LIQUIFYING APPARATUS

Palemon T. Medina, 5420 Lindberg St., Saginaw, Mich. 48603

Filed Sept. 27, 1973, Ser. No. 401,354

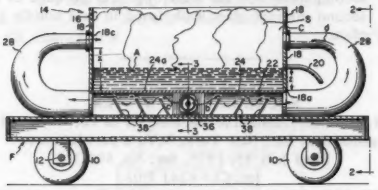
Int. Cl.² F24H *1/00*

U.S. Cl. 126—343.5 R **1 Claim**

1. Apparatus for liquifying snow comprising:
a snow receiving hopper having opposed, downwardly converging sidewalls and opposed end walls spanning said side walls, said side walls and end walls defining a snow receiving chamber for receiving snow to be liquified, said chamber having an open bottom, said end walls each having an opening therethrough;
a heat transfer manifold for introducing snow liquifying, heated fluid into the chamber to liquify snow in the chamber;
said manifold comprising an annular hollow duct having a duct portion underlying said hopper and closing said bottom, said duct also having a pair of 180° loop sections

provided with terminal ends communicating with said openings in said end walls to communicate heated fluid to said chamber;

said duct portion underlying said hopper includes upper and lower walls, said upper walls closing said open bottom, and a plurality of vertically inclined baffles mounted on said lower wall terminating a predetermined distance from said upper wall for deflecting said heated medium



toward said upper wall to heat and melt snow within said chamber; and

liquid outlet means in one of said end walls a predetermined distance above said duct portion for permitting the escape of the liquified snow after a predetermined amount of liquified snow is permitted to collect on said duct portion, said terminal ends extending through said end walls at a level above said liquid outlet means.

3,981,297

GAS SAMPLING CATHETER ASSEMBLY AND METHOD

Karl L. Dunn, Salt Lake City, and Gordon S. Reynolds, Bountiful, both of Utah, assignors to Sorenson Research Co., Inc., Salt Lake City, Utah

Filed Mar. 3, 1975, Ser. No. 555,007

Int. Cl.[2] A61B *5/00*

U.S. Cl. 128—2 G **12 Claims**

1. A catheter for sampling gases in vivo comprising:

a hollow generally flexible gas-impermeable tube having a leading end at least a portion of which is adapted to be inserted into the body of a patient;

a gas-permeable membrane traversing the entire length of the insertable portion of the tube;

means at the leading end of the tube for communicating the hollow of the tube and the inside of the gas-permeable membrane; and

a gas-impervious barrier means circumscribing the tube between the tube and membrane behind the communicating means to prevent gas transfer to the leading end from membrane behind the barrier.

3,981,298

METHOD OF TREATING INGROWN NAIL

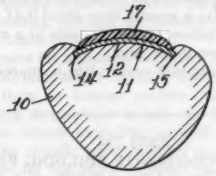
Philip G. Vironda, 71 S. LaVista Blvd., Battle Creek, Mich. 49015

Filed July 23, 1973, Ser. No. 381,603

Int. Cl.[2] A61F *5/00*

U.S. Cl. 128—81 R **10 Claims**

1. A method for treating an ingrown nail condition which comprises applying a coating consisting essentially of a hardenable substantially liquid material having adhesive properties with respect to the surface of the nail over a rearwardly disposed limited area substantially across the entire width of the nail and at an area having a substantially normal radius of curvature, permitting said material to harden and to become affixed to the surface of the nail to form a support, and permitting the hardened material to remain on said nail until it has progressed forwardly to a position at the forward end of said nail and has substantially increased the radius of curvature at



the forward end of the nail, and removing said hardened material, the thickness of said coating being sufficient to retain substantially the curvature of the coated portion of said nail as it grows to the end of the toe and is eventually removed.

3,981,299

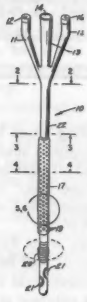
URETHRAL CATHETER

Harry Elmer Murray, 412 E. Pierce, Kirksville, Mo. 63501

Filed Mar. 15, 1971, Ser. No. 603,371

Int. Cl.[2] A61M *25/00*

U.S. Cl. 128—349 B **2 Claims**

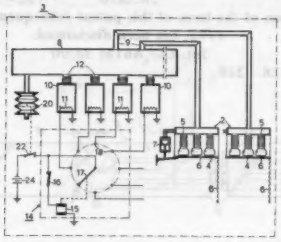


1. A urethral catheter comprising an elongated body portion having drainage openings near one end thereof and a drainage tube extension at its opposite end, an inflatable element on said body portion in spaced relation to said drainage openings, a coacting inflation means for said inflatable element on the body portion near said opposite end, a porous thin flexible outer membrane sleeve on and surrounding the body portion over a substantial portion of its length and spaced from said inflatable element and having opposite end portions joined to said body portion, said thin membrane sleeve tending to collapse against the exterior of the body portion due to confining pressure when the catheter is inserted into a body cavity, a multiplicity of spaced relatively small uniform height and substantially equally sized fixed projections on the exterior of the body portion and lying beneath the membrane sleeve and serving to maintain the latter spaced from the exterior of the body portion over substantially the full area of the sleeve and preventing collapse of the membrane sleeve inwardly against the body portion, and fluid conduit means on the body portion near said opposite end and communicating with the interior of the membrane sleeve, whereby fluids may be introduced into the membrane sleeve for treatment of the urethral canal while the catheter is implanted therein.

3,981,300
OXYGEN SUPPLY SYSTEMS FOR AIRCRAFT

Irving Williams, 4 Harav Uziel St., Tel Aviv, Israel

Filed Jan. 22, 1975, Ser. No. 543,072
Int. Cl.² A62B 7/08
U.S. Cl. 128—142 R 5 Claims

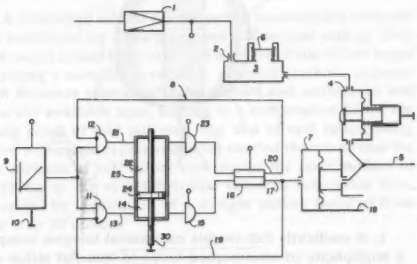


1. A system for supplying oxygen to oxygen masks in an aircraft cabin, comprising: a plurality of chemical oxygen generators each of the type actuated by an igniter and each including igniter means which, when energized, causes its chemical oxygen generator to generate oxygen; sequencer means connected to said igniter means for energizing same in sequence; a plurality of oxygen masks within said aircraft cabin; an oxygen distribution system distributing the oxygen from said chemical oxygen generators to said oxygen masks in the aircraft cabin; said distribution system including a common chamber, a conduit from each of said chemical oxygen generators to said common chamber, and a conduit from each oxygen mask to said common chamber; and pressure sensing means disposed to sense the pressure in a predetermined part of said oxygen distribution system and controlling said sequencer means to energize said igniter means of said chemical oxygen generators in sequence in response to the pressure sensed in said part of the distribution system.

3,981,301
PNEUMATICALLY CONTROLLED RESPIRATION DEVICE

Detlef Warnow, and Hans-Jörg Ziebrecht, both of Lubeck, Germany, assignors to Dragerwerk Aktiengesellschaft, Germany

Filed June 26, 1975, Ser. No. 590,490
Claims priority, application Germany, June 27, 1974, 2430839
Int. Cl.² A61M 16/00
U.S. Cl. 128—145.8 10 Claims



1. In a pneumatically controlled respiration device in which breathing gas, taken from a pressure-gas supply source through an injector and volumetrically metered in a pressure regulating valve, is supplied, in the inspiration phase, to the user and discharged, in the expiration phase, through an exhaling valve, the improvement comprising, in combination, a source of respiration gas; a respiration gas enclosure element; an injector connected between said source and said enclosure element for delivering respiration gas thereto; a pressure regulating valve connected to said enclosure element; an exhaling valve means having an opening to atmosphere; a user line connected to said pressure regulating valve and to said opening of said exhaling valve means; said pressure regulating valve including means for volumetrically metering the respiration gas delivered to said user line; said exhaling valve means normally establishing communication between said user line and said opening for the expiration phase and, responsive to application of a control pressure thereto, blocking communication between said user line and said opening to initiate the inspiration phase; means forming a fixed volume control space divided into an inspiration chamber and an expiration chamber; means operable to adjust the ratio of the volumes of said chambers; a source of control gas under pressure; a frequency valve connected to said source of control gas, first and second pneumatic control elements; said first and second elements directly connecting said inspiration and expiration chambers, respectively, on the upstream sides, to said frequency valve and each including means operable, only when enabled, to supply control gas to the associated chamber from said frequency valve for filling of the associated chamber with control gas; said first and second pneumatic control element includes means for enabling the same only when control gas is supplied thereto solely from said frequency valve; third and fourth pneumatic elements each having inputs connected, respectively, to said source of control gas and directly to the downstream sides of said inspiration and expiration chambers, respectively, and each having an output; each of said third and fourth pneumatic elements including means responsive to filling of the associated chamber with control gas for connecting the source of control gas to its output; the output of each second pneumatic element being without pressure until the associated chamber has been filled with control gas; means connecting the output of each third and fourth pneumatic elements to each of said first and second pneumatic control elements, respectively, whereby said first and second pneumatic control elements are responsive to filling of the associated chamber with control gas and thereby, the output of said third and fourth pneumatic elements such that each first and second pneumatic control element is no longer enabled and blocks flow of control gas from said frequency valve to each associated chamber so that the control gas in the associated chamber is discharged through the associated third and fourth pneumatic element; and means connecting the output of the respective fourth pneumatic element connected to said expiration chamber to said exhaling valve means for applying control pressure to said exhaling valve means for closing said opening to atmosphere to initiate the inspiration phase; the respective first pneumatic control element connected to said inspiration chamber being enabled, due to the lack of pressure at the output of the respective third pneumatic element connected to said inspiration chamber, to initiate filling of said inspiration chamber with control gas from said frequency valve; whereby the lengths of the respective phases of the respiration cycle are determined solely by the filling times, and thus the volumes, of the respective chambers.

3,981,302
EMERGENCY BREATHING MEANS

Herbert F. Veit, Fullerton, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 26, 1975, Ser. No. 553,282
Int. Cl.² A62B 7/14
U.S. Cl. 128—203 10 Claims

1. A unitized emergency breathing supply system comprising:

a container;

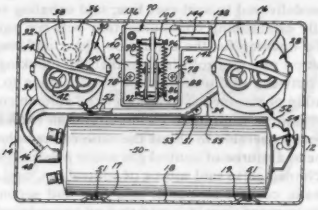
emergency breathing means stored in said container for retrieval therefrom;

lid means attached thereto;

latch means consisting of means entirely within said container locking said lid means in closure of said container;

latch triggering means within said container responsive to a preselected value of ambient pressure to operate said latch means and release said lid including ambient pressure-sensitive means in an enclosed housing having a single vent port; and

test probe attachment means on the exterior of said container, conduit means communicating said test probe attachment means to said vent port for the sealed application of a source of controlled fluid pressure to said housing to permit testing of the preselected value of pressure of said latch triggering means.



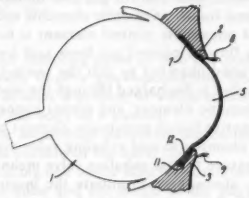
3,981,303
BIOERODIBLE OCULAR DEVICE

Takeru Higuchi; Anwar A. Hussain, Lawrence, Kans., and John W. Shell, Los Altos, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 179,129, Sept. 9, 1971, abandoned. This application July 31, 1975, Ser. No. 600,793

Int. Cl.² A61M *31/00*

U.S. Cl. 128—260 **22 Claims**



1. A bioerodible ocular device for the controlled continuous administration of a predetermined dosage of drug to the eye over a prolonged time period, the device

a. being of an initial shape and size that it is adapted for insertion and retention in the sac of the eye; and

b. comprising:

i. a plurality of microcapsule reservoirs each of which is comprised of a drug formulation confined within a drug release rate controlling material and each of which includes means inherent in its structure by which it is adapted to be eliminated automatically from the ocular cavity during or after the prolonged time period, the reservoirs being distributed throughout

ii. a bioerodible matrix that is permeable to the passage of drug at a higher rate than the rate of drug passage through the drug release rate controlling material,

whereby the drug is released from the reservoirs to the eye at a therapeutically effective, controlled rate and as the bioerodible matrix erodes in the eye the reservoirs are freed therefrom so that they may be eliminated from the eye per said means.

3,981,304
DISPENSING AND APPLICATING DEVICE AND PRODUCTION OF SAME

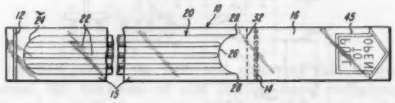
Roman Szpur, 2685 Culver Ave., Kettering, Ohio 45429

Continuation-in-part of Ser. No. 486,463, July 8, 1974, Pat. No. 3,896,808. This application June 11, 1975, Ser. No. 585,876

The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.

Int. Cl.² A61M *35/00*

U.S. Cl. 128—269 **21 Claims**



1. A device for dispensing a fluid, comprising a flexible container including a container portion defining a chamber adapted to receive the fluid, a piercing member extending within said chamber and providing said container portion with increased rigidity, means for sealing said container portion to confine the fluid and said piercing member within said chamber, said piercing member including means for piercing at least one hole in said container portion in response to relative movement between said container and said piercing member to provide for dispensing the fluid from said container portion, and said container includes a tab portion projecting from said container portion and adapted to be folded adjacent said piercing means and pulled to effect piercing of said hole by said piercing member.

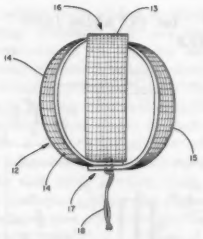
3,981,305
LOW DENSITY TAMPON OF INTERMESHED DEFORMABLE STRIP MATERIAL AND INSERTER THEREFOR

David F. Ring, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sept. 11, 1975, Ser. No. 612,488

Int. Cl.² A61F *13/20*

U.S. Cl. 128—285 **20 Claims**



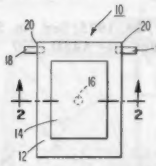
1. A resiliently deformable catamenial tampon comprising a multiplicity of intermeshed loops of thin flat strips of low density absorbent material which is resiliently deformable in dry or wet condition, said intermeshed loops being disposed to form an openwork spheroid in which said loops cross over each other at the top and bottom of the vertical axis of said spheroid and have a withdrawal string attached at the loop crossover areas to secure together the loop areas at the bottom of said axis.

3,981,306

MULTILAYER ONE-PIECE DISPOSABLE DIAPERS

Evelyn H. Krusko, Newtown Square, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Aug. 11, 1975, Ser. No. 603,298
Int. Cl.[2] A16F 13/16; A41B 13/02
U.S. Cl. 128—287 21 Claims



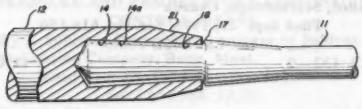
1. A multilayer, one-piece, disposable diaper comprising a liquid-impervious backing layer having sufficient longitudinal and transverse dimensions for encircling the thigh and waist regions of a wearer, a fluid-absorbent pad adapted to be disposed in the perineal region of the wearer for receiving and retaining body fluids, said pad constituting the primary absorbent component, by weight, of the diaper and being superposed on said backing layer and means for providing adjustable movement between said backing layer and said pad comprising bonding means securing the fluid-absorbent pad to the backing layer over only a limited region disposed inwardly of at least two corners of said pad for permitting marginal sections of the pad which constitute at least 50% of the total pad area to move independently of the backing layer.

3,981,307

THERMAL ATTACHMENT OF SURGICAL SUTURES TO NEEDLES

Emil Borysko, Somerville, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 484,471, July 1, 1974, abandoned. This application June 12, 1975, Ser. No. 586,312
Int. Cl.[2] A61B 17/06
U.S. Cl. 128—339 7 Claims



1. A controlled release needle-suture combination comprising a needle having a sharp end and a blunt end with an elongated recess in said blunt end, and a suture of size 4/0 or larger comprising a normally crystalline, oriented synthetic polymer which becomes substantially disoriented and amorphous and is laterally swellable upon heating to a temperature below the melting point of said polymer, one end of said suture being located within said recess and being swelled therein so that the outer surfaces of said suture end engage the inner surface of said recess to the extent that said suture is removable from said recess by application of a straight pulling force of from about 3 to 30 ounces.

3,981,308

POSITIVE-LOCKING SURGICAL CLAMP

Allen P. Schlein, 111 Marconi Ave., Bridgeport, Conn. 06610

Filed Mar. 3, 1975, Ser. No. 554,719
Int. Cl.[2] A61B 17/00; B25B 7/12
U.S. Cl. 128—346 2 Claims

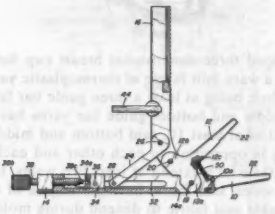
1. A surgical clamp comprising, in combination:

a first substantially straight channel-shaped handle of U-shape cross-section having an open side and forward and rearward ends and having an integral elongated stationary jaw extending substantially co-linearly from the forward end thereof,

a second channel-shaped handle of U-shape cross-section having an open side and forward and rearward ends disposed with its open side in confronting relationship with the open side of said first handle, said second handle being substantially straight throughout a major portion of its length and having its forward end curved away from the first handle,

a movable elongated jaw disposed between and transversely pivoted to the channel walls at the forward end of said first handle rearwardly of said stationary jaw and disposed within and transversely pivoted to the channel walls of the second handle near the extremity of its curved forward end and arranged to cooperate with the stationary jaw to grip an article,

an overcenter locking element comprising a lever having a forward end transversely pivoted to and between the



channel walls of the second handle at a point rearwardly of the pivotal connection thereof with the movable jaw and inclined rearwardly with its other end engaging a block member slidably supported within the channel of the first handle, said block member having pins extending transversely therefrom and engaging longitudinal slots formed in the channel walls and being longitudinally adjustable by an adjusting screw threaded into the rearward end of the first handle, said locking element being arranged to lock the clamp when the handles are squeezed by hand into contact with each other, and

means for releasing the clamp comprising a disk eccentrically pivoted to and between the channel walls of said second handle by a transverse pivot pin, said disk being secured to said transverse pivot pin, and a release lever secured to said transverse pivot pin and disposed closely parallel along and outside one of the channel walls of the second channel, said disk being engageable with the surface of the locking element lever that confronts the second handle and operative upon rotation of said release lever and said transverse pivot pin to impart a releasing movement to said locking element.

3,981,309

PATIENT STIMULATING PACER ELECTRODE

Robert Lee Cannon, Waltham, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 23, 1974, Ser. No. 535,466
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.[2] A61N 1/04
U.S. Cl. 128—419 P 2 Claims

2. An electrode system capable of use with an electronic heart pacer, said system comprising at least one insulated electrical conductor whose distal ends are electrically connected between electrical output of said pacer and tissue of said heart, said tissue-connected distal end comprising electrically conductive porous means having point contact-welded

metallic dust particles for conducting current from said pacer into said tissue in a manner to simultaneously decrease polarization losses and increase current density at the interface of said tissue and said conducting means.

3,981,310

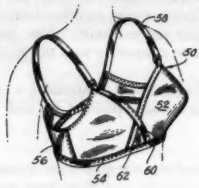
MOLDED BRASSIERE CUPS

James G. Donaghy, Flanders, N.J., assignor to International Playtex, Inc., New York, N.Y.

Filed Jan. 22, 1975, Ser. No. 542,995

Int. Cl.² A41C *3/00*

U.S. Cl. 128—464 **7 Claims**



1. A molded three-dimensional breast cup for a brassiere comprising a warp knit fabric of thermoplastic yarns throughout, said fabric being at least a three guide bar fabric, including top, middle and bottom guide bar yarns having a denier per filament of at least 10, said bottom and middle guide bar yarns being in opposition to each other and each having underlap lengths which extend at least two wales, but not more than three wales, said fabric having a degree of stretch sufficient to enable said fabric to distend during molding from an initially planar condition to a three-dimensional configuration, and in which said warp knit fabric yarns form stitches with overlaps and underlaps that are substantially dimensionally stabilized, said fabric top bar yarns appearing on both surfaces of the molded breast cup for soft molded fabric surfaces.

3,981,311

AROMATIC COMPOSITIONS

Edouard P. Demole, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

Division of Ser. No. 482,776, June 24, 1974. This application June 12, 1975, Ser. No. 586,387

Claims priority, application Switzerland, Jan. 19, 1971, 773/71; June 23, 1971, 9156/71; Jan. 11, 1972, 380/72

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² A24B *3/14, 13/00, 15/08*

U.S. Cl. 131—144 **6 Claims**

1. A process for improving, enhancing or modifying the organoleptic properties of a tobacco product, which comprises adding thereto about 1 to about 1000 parts per million based on the weight of tobacco of at least one compound selected from the group consisting essentially of:

a. 2-hydroxy-5-methyl-acetophenone

b. 2-methyl-5-isopropenyl-anisole.

3,981,312

HAIR WAVING METHOD WITH A PREBONDER

Kanu I. Patel, Chatsworth, Calif., assignor to Redken Laboratories, Inc., Van Nuys, Calif.

Filed July 3, 1975, Ser. No. 592,806

Int. Cl.² A45D *8/00*

U.S. Cl. 132—7 **24 Claims**

1. In a process for waving hair which includes the steps of contacting the hair with a reducing agent to reduce the hair followed by contacting the hair with an oxidizing agent to reconstitute the hair, the improvement comprising the step of prebonding the hair prior to contact with the oxidizing agent by contact with at least one polyvalent metal salt in an aqueous solution and at least one water soluble reactive polyamide-epichlorohydrin resin in an aqueous solution.

3,981,313

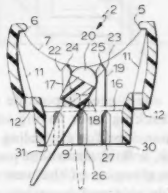
HAIR DRYER CONCENTRATOR

Frederick A. Burke, Riverside, and Douglas A. Long, Wilton, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,081

Int. Cl.² A45D *1/00*

U.S. Cl. 132—9 **10 Claims**



1. A concentrator for airflow hair dryers comprising

a housing having

an inlet and

a terminal outlet for a flow of air therethrough, said terminal outlet being of a size less than said inlet,

a hair-engaging member,

means for mounting said hair-engaging member adjacent said terminal outlet, and

positioning means for selectively positioning said hair engaging member in plural hair-engaging positions in relation to said terminal outlet.

3,981,314

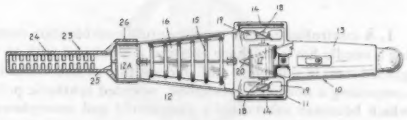
HAIR DRYER

George Barradas, Glenville, Conn., assignor to Venus Electric Limited, Scarborough, Canada

Filed Sept. 25, 1975, Ser. No. 616,550

Int. Cl.² A45D *20/00*

U.S. Cl. 132—9 **11 Claims**



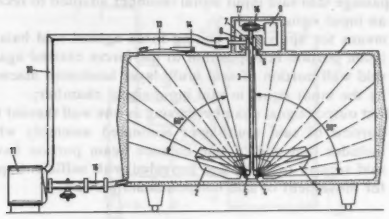
1. A hair dryer comprises an elongated casing, said casing providing a fan housing and a heater housing extending longitudinally therefrom, the fan housing providing a pair of laterally spaced air inlets and the heater housing providing an air outlet, electric heating means mounted in said heater housing, an electric motor mounted in said fan housing, a pair of fans located in the fan housing and coupled to the motor to be driven thereby, each fan cooperating with a respective one of said air inlets, deflector means located in the fan housing and positioned to deflect incoming air from each of said inlets into said heater housing, and means for supplying electric current to said electric heating means and said motor.

3,981,315

STIRRING APPARATUS FOR A LIQUID TANK

Klaas Olthoff, Leek, Netherlands, assignor to Alfa-Laval N.V., Groningen, Netherlands

Filed Sept. 30, 1974, Ser. No. 510,789
Int. Cl.² B08B 3/00, 9/00
U.S. Cl. 134—167 R 3 Claims



1. A stirring apparatus for a liquid tank comprising
a rotatingly driven hollow shaft extending downward in the tank,
stirring paddles mounted on said shaft and extending radially from the shaft,
means for applying a pressurized cleaning fluid into the upper end of the hollow shaft,
said hollow shaft extending to adjacent the bottom of the tank,
said paddles extending downward to at least the bottom of the shaft,
said paddles having cutouts adjacent the bottom of the shaft,
spray nozzles disposed on the bottom of the hollow shaft in said cutouts and aligned with said paddles, and
said spray nozzles being directed radially outward and upward over the front and back sides of each of the stirring paddles such that the front and back sides of the paddles and the inside of the tank are cleaned by the cleaning liquid as the shaft is rotated.

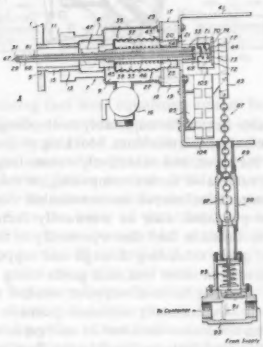
3,981,316

PRESSURE AND TEMPERATURE-RESPONSIVE CONTROL MEANS

Timothy J. Sullivan, Butte, Mont., assignor to Sullivan Valve & Engineering Company, Butte, Mont.

Filed Nov. 13, 1975, Ser. No. 631,701
Int. Cl.² F16K 17/38
U.S. Cl. 137—73 13 Claims

1. Pressure- and temperature-responsive actuator means for operating a load device (83) in response to the pressure and temperature conditions within the chamber of a vessel (1), and to the temperature conditions external of the vessel, said vessel containing a wall opening (5), comprising
a. a hollow support member (7) containing a first chamber (9), said support member being adapted for connection at one end with said vessel wall opening, said support member having a first opening at said one end affording communication between the vessel chamber and said first chamber, said support member having at its other end a second opening (23), the load device being spaced from said second opening externally of said support member; and
b. a pressure- and temperature-responsive assembly mounted for longitudinal displacement in said second opening to operate said load device, said assembly including
1. a tubular member (29) one end of which is closed to define a probe adapted to extend into the vessel chamber via said first support opening and the vessel wall opening, the other end of said tubular member being open and extending through said support member second opening;
2. expansible pressure-responsive means (35) disposed in said first pressure chamber and defining therein a second pressure chamber (37) which is in communication, via said second wall opening, with the adjacent region external of said support member;
3. first spring means (53) biasing said tubular member axially away from the load device, said expansible pressure-responsive means being connected between said hollow support member and said tubular member to produce axial displacement of said tubular member toward said load device when the pressure in said first chamber exceeds that of said second chamber by a predetermined amount;



4. a rod (61) arranged longitudinally within said tubular member, one end of said rod terminating adjacent the closed probe end of said tubular member and the other end of said rod extending beyond the open end of said tubular member;
5. first temperature-responsive fusible means (67) adjacent the closed end of said tubular member normally connecting said one end of said rod with said tubular member;
6. a load operating member (70) adjacent said other end of said rod;
7. second temperature-responsive fusible means (74) normally connecting said load operating member with said other end of said rod; and
8. second spring means (77) arranged between said load operating member and said other end of said tubular member for biasing said rod longitudinally away from said closed end of said tubular member, whereby, when the fluid pressure of the first chamber exceeds that of said second chamber by a predetermined amount, said pressure and temperature assembly is displaced longitudinally toward the load device against the biasing force of said first spring means, whereby when the temperature sensed by the probe exceeds the melting temperature of said first fusible connecting means, said rod is released and is longitudinally displaced toward the load device by said second spring means, and whereby when the melting temperature of said second fusible means is exceeded, said operating member is released and is displaced toward the load device by said second spring means.

3,981,317

FLAME-ARRESTING OR SMOKE-CLEARING VALVE DEVICE OPERATING BY CLOSURE AND OPENING RESPECTIVELY

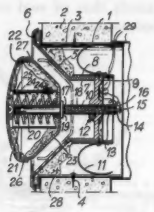
Wilhelm Paul Strulik, 2, rue d'Heurtebise, Roussemeau-Villeneuve-sur-Yonne, (Yonne), and Claude Mealares, 40, rue Jean Baffier, Saint-Florent-sur-Cher, (Cher), both of France

Filed Feb. 3, 1975, Ser. No. 546,829

Claims priority, application France, Feb. 12, 1974, 74.04607

Int. Cl.² F16K *17/38*

U.S. Cl. 137—75 7 Claims



1. A valve device for adjustably controlling air flow through a mechanical ventilation duct, blocking propagation of flames through the duct, and selectively exhausting smoke through the duct, said valve device comprising, in combination, an air extraction terminal sleeve communicable with the ventilation duct and provided with an outwardly facing valve seat; a support mounted in said sleeve inwardly of said valve seat; an elongated guide extending through said support and having an inner end and an outer end, said guide being adjustable longitudinally relative to said support; means maintaining said guide in a longitudinally adjusted position relative to said support; an obturator mounted on said guide outwardly of said support for adjustably controlling the flow area into said terminal sleeve, said obturator including an outwardly convex dome member fixedly secured to the outer end of said guide and an inwardly convex valve member having conforming seating engagement with said dome member and arranged to conformingly engage said valve seat to block flow into said terminal sleeve; said valve member being slidable on said guide; spring means surrounding said guide within said obturator and biasing said valve member to separate from said dome member to engage said valve seat; and a pin engaged with said guide and restraining separation of said dome and valve members, said pin releasing such restraint responsive to detection of a fire whereby said valve member is disengaged from said dome member to engage said valve seat to block said terminal sleeve.

3,981,318

PNEUMATIC OUTPUT SIGNAL LIMITING DEVICE

Robert C. Prescott, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Feb. 3, 1975, Ser. No. 546,573

Int. Cl.² G05D *16/00*

U.S. Cl. 137—86 8 Claims

1. A pneumatic output signal limiting device having a planartype laminated sandwich construction, comprising, in combination:

a multi-layer laminated assembly having

a resilient diaphragm layer and

at least one relatively stiff spring layer

said at least one relatively stiff springy layer having a stationary portion and a balance beam portion joined at a point between the ends thereof to said stationary portion by flexure axis portions for pivotal movement of said balance beam portion about the axis of said flexure portions.

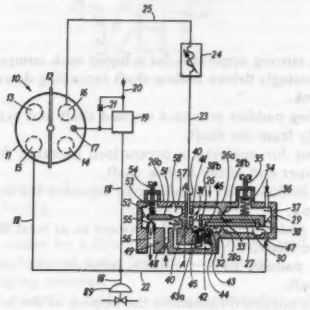
a passage extending through said balance beam portion having a first opening and a second opening on opposite sides of said axis;

an input signal chamber having as one wall thereof that portion of said multi-layer laminated assembly which includes that end of said balance beam portion having said first opening and provided with sufficient space for movement of said balance beam portion;

a passage into said input signal chamber adapted to receive an input signal;

a means for applying a biasing force against said balance beam portion in opposition to the forces exerted against said wall portion of said multi-layer laminated assembly by the input signal in said input signal chamber;

a first output signal chamber having as one wall thereof that portion of said multi-layer laminated assembly which includes that end of said balance beam portion having said second opening and provided with sufficient space for movement of said balance beam portion;



a vent passage in said first output signal chamber for venting said first output signal chamber;

a valve in said vent passage spring biased to a closed position and having an outwardly extending plug portion arranged to close said second opening of said passage extending through said balance beam portion upon movement of said balance beam portion in one direction and upon further movement in the same direction to open said valve;

a fulcrum support means adapted to support said flexure portions;

a second output signal chamber on the other side of said multi-layer laminated assembly from said first output chamber with sufficient space for movement of said balance beam portion;

a passage providing communication between said first and second output signal chambers;

an output signal passage out of said first output signal chamber for transmitting the output signal from said first output signal chamber.

3,981,319

CYCLING AIR VOLUME CONTROL

Corbly LeRoy Holt, Clearwater, Fla., assignor to Brady Air Controls, Inc., Muncie, Ind.

Filed May 5, 1975, Ser. No. 574,580

Int. Cl.² F04D *1/00*

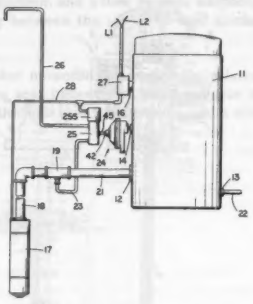
U.S. Cl. 137—211 19 Claims

1. A cycling air volume control for an air-pressurized hydraulic system comprising:

an air storage chamber assembly including a housing having a cavity therein for a control fluid therein and air therein, the respective volume of fluid and air therein being variable, first aperture means in said housing to permit entrance of air to said cavity from atmosphere, second

aperture means in said housing to permit entrance and departure of said control fluid, and third aperture means in said housing to permit discharge of air therefrom to a liquid storage vessel;

and switchable valve means having an operating energy source independent of energy stored in the liquid storage vessel, said switchable valve means being coupled to said



second aperture of said storage chamber assembly and operable to periodically change fluid passages and communicating with said second aperture to enable periodically changing a pressure difference between said second and third aperture means to thereby periodically vary the respective volumes of fluid and air in said air storage chamber assembly.

3,981,320

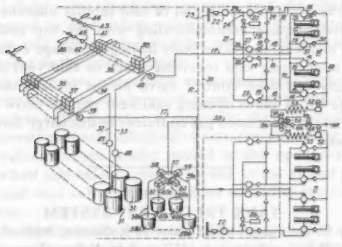
RECOVERY SYSTEM FOR SPRAY PAINTING INSTALLATION WITH AUTOMATIC COLOR CHANGE

Richard F. Wiggins, Fairfield, Conn., assignor to The Gyromat Corporation, Stratford, Conn.

Division of Ser. No. 468,973, May 10, 1974, Pat. No. 3,939,855. This application Apr. 9, 1975, Ser. No. 566,290

Int. Cl.² B05B *5/02, 7/26*

U.S. Cl. 137—240 **13 Claims**



1. A color change system for a paint spray installation, which comprises

a. a paint spray station,

b. a paint supply area located remote from said spray station and including first supply means for supplying paints and cleaning materials for the spray station,

c. supply conduit means for delivering said paints and cleaning materials to said spray station,

d. purge discharge conduit means communicating with said spray station for conveying paints and cleaning materials away from said spray station, and

e. second supply means connected to said purge discharge conduit for introducing cleaning materials into said purge discharge conduit immediately adjacent said spray station.

3,981,321

VEHICLE FUEL SYSTEM

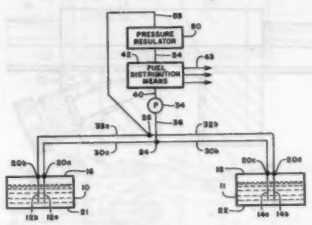
John T. Risse, and James C. Taggart, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 24, 1974, Ser. No. 508,940

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² F02M *37/00*

U.S. Cl. 137—255 **4 Claims**



1. A self-regulating fuel level equalizing system for internal combustion engines of vehicles comprising a plurality of spaced apart fuel tanks, feed conduits having about equal length, about equal inner diameter, and about equal fuel flow restriction and having lower portions with open ends each disposed at about the same level for automatic preferential fuel withdrawal from the fuller of said tanks, housed within and extending from lower portions of each of said tanks through an upper portion of each of said tanks and devoid of external bottom connections with said tanks and each coupled to a fuel pump, a fuel pump for preferentially withdrawing fuel from the fuller of said tanks through said feed conduits and supplying at least a portion of said fuel to a said engine, distribution means for feeding said fuel from said fuel pump to said engine, return conduits separate from said feed conduits having about equal length, about equal inner diameter, and about equal fuel flow restriction, and having lower portions with open ends each disposed at about the same level in said tanks for automatic preferential fuel return to the less full of said tanks, housed within and extending from lower portions of each of said tanks through and upper portion of each of said tanks and coupled to said fuel pump for preferentially returning any unused portion of said withdrawn fuel to the less full of said tanks, said preferential fuel withdrawing and returning automatically coacting to maintain an about equal fuel level in said fuel tanks.

3,981,322

PIPE CONNECTING DEVICE

Sven Runo Vilhelm Gebelius, Fridhemsgatan 27, Stockholm, Sweden (S-11240)

Continuation of Ser. No. 481,471, June 20, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 611,320

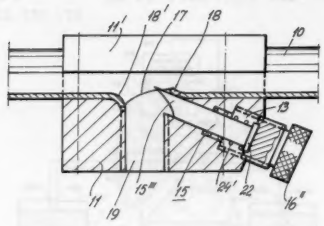
Claims priority, application Sweden, June 25, 1973, 7308865

Int. Cl.² F16K *51/00*

U.S. Cl. 137—318 **1 Claim**

1. A pipe connection means for crosswise-extending pipe connections to transport pipes for fluid, gas or similar media, said pipe connection means including at least one flow channel intersecting the transport pipe and directed towards a connection pipe, and a guiding channel directed towards the transport pipe, said guiding channel including a hole-cutting, piercing member movable in said guiding channel to pierce the transport pipe adjacent the intersection of said flow channel with said transport pipe and create a hole through said transport pipe, said piercing member being connected to a maneuverable adjusting member arranged to move the hole

piercing member in the guiding channel in directions to and from the transport pipe, edge portions of the hole forming a valve seat, the hole piercing member having an end portion functioning as a valve element and acting against said valve seat, the guiding channel being arranged at an acute angle in relation to the longitudinal axis of the transport pipe, the end portion of the hole piercing member functioning as a cutting



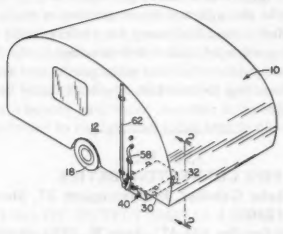
member and being arranged to cut out and form an inwardly directed guiding member and an outwardly directed guiding member when moved in a direction towards the transport pipe and therethrough, said guiding members, in connection with the edge portions of the hole, forming said valve seat and the cutting part of the piercing member forming the valve element.

3,981,323

REMOVABLE FLUID HOLDING TANK FOR VEHICLE

Clarence V. Watson, 4715 Rivercrest Drive North, Salem, Oreg. 97303

Filed Jan. 13, 1975, Ser. No. 540,421
Int. Cl.² B60P *1/00*
U.S. Cl. 137—344 **4 Claims**



1. In combination with a vehicle having a body with plumbing therein,

a liquid holding tank below said plumbing,

conduit means extending from said plumbing to the tank, said conduit means connecting with the top of the tank and extending into the tank to a region adjacent the base of the tank and at said region communicating with the interior of the tank, said conduit means further including an expanse outside said tank at an elevation below the base of the tank, and

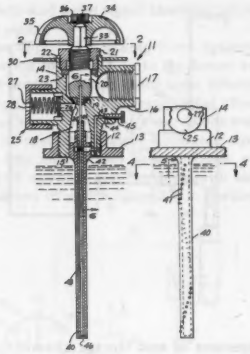
means detachably connecting said conduit means to said plumbing, said conduit means on disconnection from said plumbing being adjustable to provide for the draining of fluid under gravity from said tank.

3,981,324

COMBINED VALVE AND OUTAGE GAUGE

Doyle Waring, Rte. 2, Box 262-B, Heber Springs, Ark. 72543

Filed Aug. 29, 1975, Ser. No. 609,007
Int. Cl.² F16K *37/00*
U.S. Cl. 137—556.6 **16 Claims**



1. A combined service valve and outage indicator for a liquified gas container comprising a valve body provided with means sealingly engagable with the outlet conduit of a gas container and having a gas transmission passage including a valve seat, a main valve element threadedly engaged in the valve body and being engagable with said valve seat, operating knob means connected to said valve element, means on the valve body adjacent said knob means for indicating the degree of rotation of said knob means, a depending tubular chamber secured to the inlet end of said gas transmission passage, said chamber being formed with spirally arranged inlet passage means, a tubular sleeve element rotatably mounted in said chamber, means axially connecting said sleeve element to the valve element, said sleeve element being formed with linear passage means registrable with said spirally arranged inlet passage means at points in accordance with the degree of rotation of said sleeve element, said valve body being formed with a vent port, the top end of said tubular chamber having a receiving space communicating with the top end of said sleeve element, the valve body having a passage communicatively connecting said receiving space to said vent port, and manually operated control valve means in said last-named passage for at times opening said vent port to allow liquified gas from the associated gas container to discharge through the vent port.

3,981,325

TANK TRUCK VENT SYSTEM

Bernie E. Robinson, and Daniel T. Robinson, both of Milwaukee, Wis., assignors to Milwaukee Valve Company, Inc., Milwaukee, Wis.

Filed Oct. 20, 1975, Ser. No. 623,747
Int. Cl.² F16K *45/02*
U.S. Cl. 137—587 **7 Claims**

1. A combination vent and safety valve system for a tank truck or the like comprising

a vent valve including

a body having a mounting flange permitting said vent valve to be mounted on an upper portion of the tank and an opening adapted to communicate with the inside of the tank,

a valve seat in said vent valve body,

a valve member mounted for movement relative to said vent valve seat between an open position to permit vapors to vent from the tank through said opening and

a closed position in sealing engagement with said vent valve seat, and

means for urging said vent valve member towards the closed position;

a safety valve including

a valve body having a mounting flange permitting said safety valve to be mounted on a lower portion of the tank, an inner portion to be located inside the tank, a discharge portion, and a flow passage adapted for communicating between the tank and said discharge portion,

a valve seat,

a valve member mounted for movement relative to said safety valve seat between an open position to permit fluid flow through said flow passage and a closed position in sealing engagement with said safety valve seat to prevent fluid flow through said flow passage,

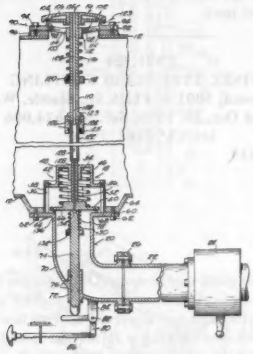
means for urging said safety valve member towards the closed position, and

movable actuator pin means having one end located inside said safety valve discharge portion and disengagably connected to said safety valve member for selectively moving said safety valve member away from said safety valve seat to the open position;

actuating rod means operatively connecting said vent valve member with said safety valve member such that, when said safety valve member is moved to the open position by movement of said safety valve actuator pin means, said vent valve member is also moved to the open position and, when said safety valve is moved to the closed position, said vent valve member is also moved to the closed position;

a vent passage extending from an inlet in said safety valve member, through said actuating rod means and through said vent valve member for venting said safety valve discharge portion when both said vent valve and said safety valve are closed, said inner end of said actuator pin means being operable to close said vent passage inlet when said actuator pin is moved to a position to open said safety valve member; and

means operatively and disengagably connecting said inner end of said safety valve actuator pin means with said safety valve member for urging said inner end of said safety valve actuator pin means away from said safety valve member to thereby open said vent passage inlet and permit said safety valve discharge portion to be vented through said vent passage when said safety valve actuator pin means is moved to a position for closing said safety valve member.



3,981,326

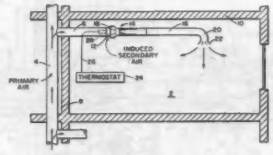
INDUCTION MIXING NOZZLE

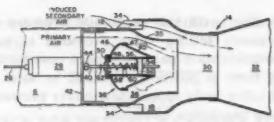
Dimiter Gorchev, Washington, D.C., assignor to Mitco Corporation, Somerville, Mass.

Continuation-in-part of Ser. No. 446,606, Feb. 28, 1974, abandoned. This application Apr. 11, 1975, Ser. No. 567,383

Int. Cl.² F16K *19/00*

U.S. Cl. 137—604 7 Claims





1. An apparatus for mixing two gas phase fluids in an air circulation system comprising:

A. a mixing nozzle;

B. adjustable flow rate injection means for introducing an annular flow of primary fluid into said mixing nozzle at a selected primary fluid flow rate; and

C. a port in said mixing nozzle adjacent to said injection means for introducing an induced annular secondary flow of fluid into said mixing nozzle,

wherein said injection means comprises:

i. a conduit having a tapered nozzle at one end thereof;

ii. a plunger coaxially mounted within said conduit to define an annular passage within said tapered nozzle, said plunger having a tapered portion wherein the lesser diamter end of said tapered portion is adjacent to the tapered end of said tapered nozzle, and wherein further the lesser diameter end of said tapered portion is blunt so that the annular primary fluid flow past said plunger has a relatively high velocity at the edge of said tapered nozzle near said induction port, and a relatively low velocity otherwise; and

iii. means for adjusting the position of said plunger along the axis of said conduit, and

further comprising a primary fluid velocity responsive means supporting said plunger within said conduit to maintain a constant primary fluid flow rate therethrough, said primary fluid flow rate being relatively independent of primary fluid input pressure variations.

3,981,327

PRESSURE REGULATION VALVE DEVICE

Kichiro Sato, c/o Mitsuhata No. 19-9,1-chome, Shin, Setagaya, Tokyo, Japan

Filed July 9, 1975, Ser. No. 594,465

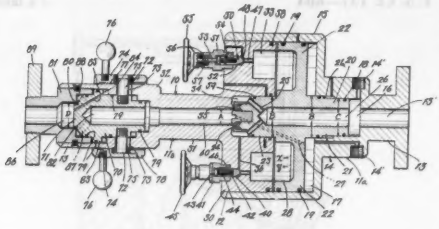
Claims priority, application Japan, July 11, 1974, 49-79415; Oct. 28, 1974, 49-124053

Int. Cl.² G05D *16/10*

U.S. Cl. 137—613 4 Claims

1. A pressure regulation valve device comprising a main body having a linear axial fluid passage, a valve seat and a pressure regulation chamber, a pressure regulation valve body for seating against and unseating from said valve seat and normally maintained under balanced condition by counterbalancing primary pressure acting on the valve body, said valve body having an intermediately positioned largest diameter

pressure receiving portion slidably received within said pressure regulation chamber to define a secondary pressure chamber on one side of the valve body and a reference pressure chamber on the other side of the valve body within the pressure regulation chamber, a primary pressure communication passage provided in said main body adjacent to said valve seat



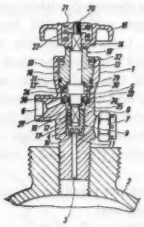
in communication with said reference pressure chamber, a reference pressure setting valve provided in said primary pressure communication passage, and a communication passage leading from a position adjacent to said valve body through said valve body to said secondary pressure chamber in the pressure regulation chamber.

3,981,328

HAND-OPERABLE TAKEOUT VALVE FOR A FLUID PRESSURIZED CONTAINER

Keitaro Yonezawa, Kobe, Japan, assignor to Kabushiki Kaisha Neriki, Japan

Filed July 24, 1975, Ser. No. 598,733
Claims priority, application Japan, Aug. 9, 1974, 49-91851
Int. Cl.[2] F16K *11/18*
U.S. Cl. 137—614.2 28 Claims



1. A hand-operable takeout valve for temporary attachement to a fluid pressurized container, comprising an outer body attachable to said container, said outer body including a fluid passage communicating with a takeout port via two adjacent chambers, said first chamber including a main valve closable of said fluid passage and said second chamber including a check valve closable of said takeout port, a stem supporting said main valve for rotational displacement, said stem passing through said check valve and being provided with a means for urging said check valve upwardly, a sleeve mounted in said outer body for rotational displacement, a spring means interposed between said sleeve and said check valve so as to maintain said check valve at a location in which to close said takeout port, and a rotating means of said stem for effecting the rotational displacement of said main valve with respect to said fluid passage.

6. A takeout valve for attachment to a fluid pressurized container, said valve comprising:

an outer body attachable to said container, said outer body including: a fluid passage, a first chamber, a second chamber, and a takeout port; said fluid passage communicating with said first chamber, said first chamber communicating with said second chamber, said second chamber communicating with said takeout port;

A main valve located in said first chamber;

a check valve and valve seat located in said second chamber;

a sleeve rotatably mounted in said outer body for axial displacement with respect to said outer body;

a stem, rotatably mounted in said sleeve, passing through said check valve and engaging said main valve, to rotate and displace said main valve with respect to said outer body to control the passage of fluid between said fluid passage and said first chamber;

a biasing means urging said check valve against said valve seat for preventing the passage of fluid between said second chamber and said takeout port;

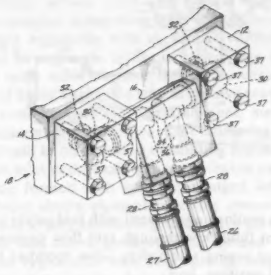
a holding means urging said check valve away from said valve seat when said sleeve is axially displaced for allowing the passage of fluid between said second chamber and said takeout port.

3,981,329

SWIVEL TYPE FLUID COUPLING

Maurice Wohlwend, 5001 S. 112th St., Seattle, Wash. 98176

Filed Oct. 20, 1975, Ser. No. 624,006
Int. Cl.[2] F16L *39/00*
U.S. Cl. 137—615 9 Claims



1. A swivel coupling for use between hanging hydraulic fluid supply and return hoses and a hydraulic tool which is pivotally mounted onto the outer end of a boom which is itself pivotally mounted at its inner end onto a construction machine, said coupling comprising:

a pair of spaced apart bearing blocks, each of which is formed to include a blind socket opening towards the space between said bearing blocks, said sockets being of cylindrical shape and being formed about a common axis which is parallel to the axis about which the hydraulic tool pivots relative to the boom, said bearing blocks having corresponding mounting sides, said bearing blocks also including internal passageways communicating with said blind sockets and extending perpendicularly of said blind sockets from adjacent the closed ends of the blind sockets to ports on the mounting sides of the bearing blocks, and

a journal block located between said bearing blocks and including a pair of coaxial, oppositely extending, open ended tubular journals which are snuggly received within said blind sockets, to mount said journal block for pivotal movement relative to said bearing blocks, said journal block being formed to include an inflow passageway for hydraulic fluid which communicates with the interior of one of said tubular journals, and an outflow passageway for hydraulic fluid which communicates with the interior of the other tubular journal, with portions of said inflow and outflow passageways extending radially outwardly of the pivotal axis of the journals to ports which are located

side-by-side on an end of the journal block, said ports including connection means for coupling them to the hydraulic supply and return hoses.

3,981,330

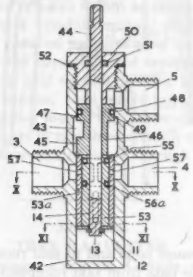
WATER MIXING TAP

Horace Watts, Pinner, England, assignor to H. & D. E. Watts Limited, Middlesex, England

Filed Aug. 5, 1974, Ser. No. 495,039

Int. Cl.² F16K *11/00*

U.S. Cl. 137—636.4 16 Claims



1. A fluid mixing valve comprising a body defining a chamber having a surface of which at least a portion is cylindrical, said cylindrical surface having a first fluid inlet therein and a second fluid inlet therein at a position spaced from said first fluid inlet, a fluid outlet leading from said chamber, valve means positioned operatively within said chamber and comprising a valve closure element and a mixture control element, a valve actuator operatively connected to said elements, said elements being supported for joint axial movement in said chamber under the control of the valve actuator, the mixture control element being supported for rotational movement relative to both the chamber and the valve closure element under the control of the valve actuator, obturating means carried by the valve closure element and engaging the cylindrical surface, said valve means being operable by the valve actuator between a closed positon in which the first and second inlets are both closed by the obturating means and an open position in which the relative degree of opening of the first and second inlets are controlled by the rotative position of the mixture control element.

3,981,331

CROSSING WARP MECHANISM

Anselmo Bolea Camprubi, Barcelona, Spain, assignor to Incotex, S.A., Sabadell (Barcelona), Spain

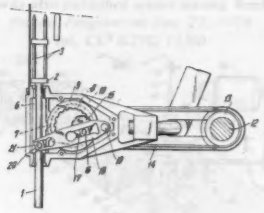
Filed July 23, 1975, Ser. No. 598,352

Claims priority, application Spain, July 31, 1974, 205051

Int. Cl.² D03D *47/40*

U.S. Cl. 139—54 6 Claims

1. A crossing warp mechanism comprising an axially extending rod, a holder plate attached to one end of said rod, a plurality of needles secured to and extending outwardly from said holder plate, a sleeve laterally enclosing an axially extending portion of said rod, said rod being connected to said sleeve so that said rod is axially slidable relative to said sleeve, first means contacting said sleeve for oscillating said sleeve about the axis of said rod, second means contacting said rod for reciprocating said rod in its axial direction, said second means being engaged between said rod and said sleeve to cause said rod to rotate together with said sleeve about its own axis when said sleeve is oscillated by said first means, and means for actuating said first and second means whereby the rod and



needles carried by said rod are oscillated and reciprocated simultaneously.

3,981,332

DEVICE FOR DRIVING A CARRIER FOR A FILLING-THREAD GRIPPER HEAD ON A LOOM

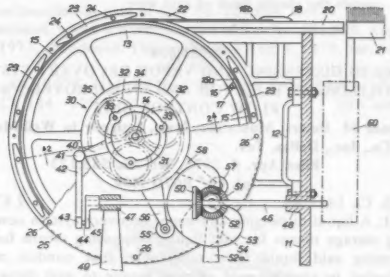
Erwin Schwarz, Ruti, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Switzerland

Filed Mar. 10, 1975, Ser. No. 557,086

Claims priority, application Switzerland, Mar. 11, 1974, 3339/74

Int. Cl.² D03D *47/00*

U.S. Cl. 139—449 5 Claims



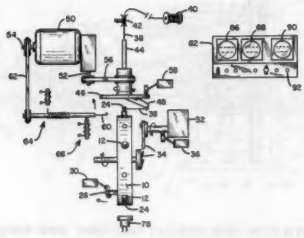
1. Drive device for a carrier of a filling-thread gripper head on a loom in which the carrier can be moved back and forth by a drive wheel which is turnable alternatively in opposite directions, with a planetary gearing arrangement comprising a sun wheel rigidly connected with the drive wheel, at least one planet wheel in engagement with the sun wheel, an outer wheel having an inner toothing which is arranged coaxial to the sun wheel and which is also in engagement with said planet wheel, a planet wheel strap which rotatably supports the said planet wheel, a drive shaft which drives the planet wheel strap by a first mechanism and the outer wheel by a second mechanism synchronously with a batten and harness drive of the loom in order to convert the movement of rotation of said drive shaft into a back and forth turning movement of said planet wheel strap and of said outer wheel around the axis of said sun wheel.

3,981,333

VARIABLE TURN COIL WINDER

Dennis Ludwig Breu, Stillwater, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 24, 1975, Ser. No. 634,397
Int. Cl.² B21F 3/04
U.S. Cl. 140—1 7 Claims



1. Apparatus for facilitating the winding of intermediately tapped electrical transformers utilizing open ferromagnetic bobbin-type cores comprising:

a. means for securing a plurality of bobbins and advancing said bobbins individually to a plurality of work stations;

b. winding means located at one of said plurality of work stations for winding each stationary bobbin core individually, with first and second groups of turns of wire, and

c. means for creating at least one intermediate tap between said first and second groups of turns by pulling the wire being wound on the bobbin core a predetermined distance away from the bobbin core upon the completion of the winding of said first group of turns and twisting the wire so withdrawn while said means for winding is applying said second group of turns to said bobbin core, the arrangement being such that the twisting ultimately exceeds the elastic limit of said wire.

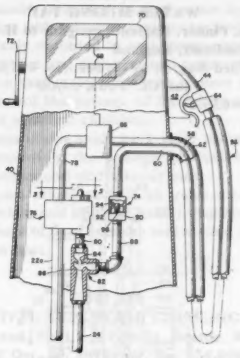
3,981,334

LIQUID DISPENSING AND VAPOR RECOVERY SYSTEM UTILIZING AN INJECTOR AND AN IMPROVED VAPOR FLOW CONTROL UNIT

Elmer M. Deters, Muscatine, Iowa, assignor to Weil-McLain Co., Inc., Dallas, Tex.

Filed Apr. 4, 1975, Ser. No. 565,123
Int. Cl.² B67D 5/04
U.S. Cl. 141—46 7 Claims

1. A liquid dispensing and vapor recovery system comprising storage means for said liquid, dispensing means for dispensing said liquid to a receptacle, first conduit means adapted to connect said storage means to said dispensing means, pump means for pumping said liquid from said storage means through said first conduit means and to said dispensing means, second conduit means connected to said first means and to said storage means for diverting a portion of said liquid in said first conduit means back to said storage means, a housing defining a first passage forming a portion of said first conduit means and a second passage communicating with said first passage and forming a portion of said second conduit means, first valve means disposed in said first passage and movable in response to changes in the flow rate of said liquid through said first conduit means, means responsive to the absence of a predetermined liquid flow rate in said first conduit means for urging said first valve means to a position in said first passage in which the flow of liquid through said first conduit means is reduced, second valve means disposed in said second passage and movable in response to said movement of said first valve means for continuously changing the flow rate of liquid through said second passage means, said second valve means preventing the flow of liquid through said second passage upon said first valve member moving to said position, means for forming a reduced pressure zone in said second conduit means in response to liquid flow through said second conduit means, and third conduit means connected to



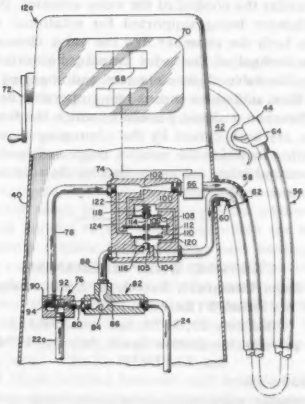
said reduced pressure zone and to said receptacle for permitting the vapors to pass from said receptacle into said second conduit means for passage into said storage means.

3,981,335

LIQUID DISPENSING AND VAPOR RECOVERY SYSTEM UTILIZING AN INJECTOR AND A VALVE FOR PERMITTING OPERATION OF LEAK DETECTING APPARATUS

Elmer M. Deters, Muscatine, Iowa, assignor to Weil-McLain Co., Inc., Dallas, Tex.

Filed Mar. 31, 1975, Ser. No. 565,728
Int. Cl.² B67D 5/04
U.S. Cl. 141—46 7 Claims



1. A liquid dispensing and vapor recovery system comprising storage means for said liquid, dispensing means for dispensing said liquid to a receptacle, first conduit means adapted to connect said storage means to said dispensing means, pump means for pumping said liquid from said storage means through said first conduit means and to said dispensing means, second conduit means connected to said first conduit means and to said storage means for diverting a portion of said liquid in said first conduit means back to said storage means,

a housing defining a first passage forming a portion of said first conduit means and a second passage communicating with said first passage and forming a portion of said second conduit means, first valve means disposed in said first passage and movable in response to changes in the flow rate of said liquid through said first conduit means, means responsive to the absence of a predetermined liquid flow rate in said first conduit means for urging said first valve means to a position in said first passage in which the flow of liquid through said first conduit means is reduced, second valve means disposed in said second passage and movable in response to said movement of said first valve means for preventing the flow of liquid through said second passage upon said first valve means moving to said position, means for forming a reduced pressure zone in said second conduit means in response to liquid flow through said second conduit means, third conduit means connected to said reduced pressure zone and to said receptacle for permitting the vapors in said receptacle to pass from said receptacle into said second conduit means for passage into said storage means, and means operatively associated with said third conduit means for continuously changing the flow rate of the vapors in said third conduit means in response to changes in the flow rate of liquid through said first conduit means.

3,981,336

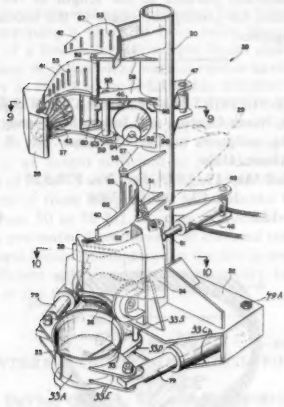
TREE HARVESTER

Joseph Lucien Levesque, Cochram, Canada, assignor to L & L Logging Research Limited, Timmins, Canada

Continuation-in-part of Ser. No. 260,278, June 6, 1972, abandoned. This application May 28, 1974, Ser. No. 474,053

Int. Cl.² A01G *23/08*

U.S. Cl. 144—3 D **4 Claims**



1. In a tree harvester of the class comprising a tree cutting and delimbing unit which first severs a tree trunk after effecting a gripping embrace of the tree and then draws the trunk through the unit to effect delimbing, a plurality of trunk gripping pulling-rollers effecting said draw, characterised in that said rollers have gripping surfaces which are longitudinally and circumferentially concave relative to their rotary axes, said delimbing unit including at least two trunk-holding arms at least partially embracing said trunk, and a delimbing knife attached to at least one of said arms for movement therewith, said delimbing knife having a concave inner surface, said rollers being so journalled between the ends of said arms as to span the same.

3,981,337

KNIFE ASSEMBLY

Erik Wilhelm Sundström, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

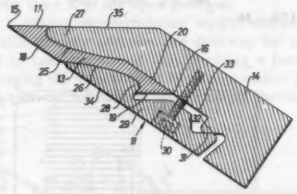
Filed Jan. 30, 1975, Ser. No. 545,630

Claims priority, application Sweden, Feb. 2, 1974, 7401608

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² B27G *13/00*

U.S. Cl. 144—241 **6 Claims**



1. Cutting insert for knife assembly, said insert having two longitudinal cutting edges (**15, 16**), the insert being symmetrical after turning on a longitudinal axis (**40**) for fastening in a holder (**14, 29**) and exposing one cutting edge at a time for cutting purposes, the cutting edges forming in cross section the acute corners of a parallellogram, the insert also having two longitudinal grooves (**27, 28**) occupying each of the two obtuse corners of said cross section each of said grooves having a hooked cross section in order to establish a hooked engagement between the cutting insert and the holder.

3,981,338

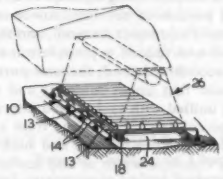
METHOD OF MAKING A COMPRESSED WOOD PANEL FROM PEELED LOGS

Charles A. Jones, 26 Gladstone Ave., Oshawa, Ontario, Canada

Continuation-in-part of Ser. No. 529,868, Dec. 4, 1974, abandoned, which is a continuation of Ser. No. 351,908, Aug. 17, 1973, abandoned. This application Aug. 4, 1975, Ser. No. 601,868

Int. Cl.² B27K *3/15;* **B27L** *1/00;* **B29D** *3/00;* **B29G** *1/00*

U.S. Cl. 144—309 D **10 Claims**



1. The process for producing building panels, comprising the steps of:

arranging in a mold a plurality of debarked dried logs, said mold having side walls to retain liquid, adding a suitable liquid adhesive to said mold to substantially fill spaces between the logs, moving said mold under a pressure applying means and subjecting said logs to mechanical pressure applied uniformly over said logs in a first pressing stage to reduce the overall thickness of said logs in the mold to less than the thickness required for the chosen panel releasing said pressure to allow the logs to expand while substantially immersed in adhesive so that their overall thickness becomes greater than the chosen final panel thickness while said adhesive is sucked into the logs,

subjecting said logs to mechanical pressure applied uniformly over said logs in a second pressing stage, to re-

move excess adhesive from said logs, the pressure applied in said second stage being less than said first stage,

draining excess liquid adhesive from said mold, moving said logs to an oven therein subjecting the logs and adhesive to elevated temperatures in a mold, to form a panel.

3,981,339

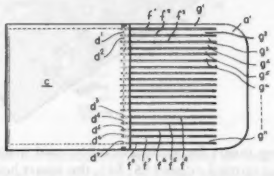
SECRET COMPARTMENT ARTICLE

Marcel M. Arnould, 17 E. Midland Ave., Kearny, N.J. 07032

Filed May 29, 1975, Ser. No. 581,828

Int. Cl.² A45C *1/00*

U.S. Cl. 150—36 **1 Claim**



1. A secret compartment device comprising in combination: at least three strip materials including a first upper material and a second intermediate material at least in part located below the first upper material in a stacked relationship, and a third lower material at least in part located below the second intermediate material in a stacked relationship, said second intermediate material having a plurality of slits extending in substantially parallel relationship to one-another from substantially a central point between opposite ends of an elongated axis of the second intermediate material, each of the three strip materials having a substantially common width with one-another, one portion of the first material being stitched to one portion of the material of the second intermediate material located between said slits, and to and through material of the third lower material for a first predetermined portion of said common width comprising a major proportion of said width, a second portion of the first upper material adjacent said one portion and comprising the remainder of said common width having second stitches stitched through said slits with the second stitches being stitched to a remaining second predetermined portion of the third lower material adjacent said one portion of said lower material, and there being an end portion located and spaced a predetermined distance from said stitches secondly stitched, the end portion including at least one of said first upper material and said third lower material being unified with said second intermediate material along edges thereof extending to and from said stitches such that an enclosure space is defined and such that for said remainder of the common width at said second predetermined portion said second stitches are slidable between the slits whereby said second intermediate material is slidable in a direction toward the enclosure space whereby articles may be inserted through slits of material pulled sufficiently in said direction, into the enclosure space and thereafter may be similarly removed therefrom.

3,981,340

COVER

Richard W. Anderson, Reading, and James L. Pettee, Winchester, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 28, 1975, Ser. No. 636,153

Int. Cl.² B65D *65/08*

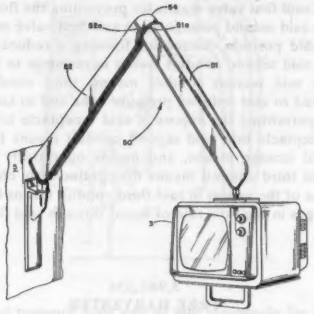
U.S. Cl. 150—52 R **11 Claims**

1. A cover comprising:

a first, generally-rectangular, generally-flat, flexigle, elongated cover section of material having a first end portion and a second, opposed end portion, said second end portion having a cup-like configuration;

a second, generally-rectangular, generally-flat, flexible, elongated cover section of material having a first end portion and a second, opposed end portion, said second end portion having a cup-like configuration;

a connecting sheet interconnecting the first end portions of the first and second cover sections and including a generally-flat, flexible, non-stretchable central section of material and first and second end sections of stretchable material connected to the central section and to the first end portions of the first and second cover sections, respectively;



first means disposed at the edges of the first cover section generally parallel to the length of the first cover section for joining the edges of the first cover section together; and

second means disposed at the edges of the second cover section generally parallel to the length of the second cover section for joining the edges of the second cover section together.

3,981,341

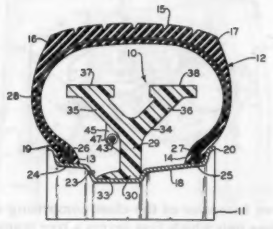
SAFETY SUPPORT FOR PNEUMATIC TIRES

John R. Bauer, North Canton, and Joseph M. Forney, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 19, 1975, Ser. No. 578,525

Int. Cl.² B60C *17/04*

U.S. Cl. 152—158 **4 Claims**



1. A safety support for use on a wheel rim for a pneumatic tire of the type having a tread portion, shoulder portions at the edges of said tread portion and bead portions for mounting the tire on said rim, said wheel rim having an annular well for positioning of said bead portions during mounting of said tire on said rim, comprising an annular central disc-like supporting member having a radially inner edge for mounting said support in said well, said inner edge having a relatively thin axially extending flange at one side of said supporting member with

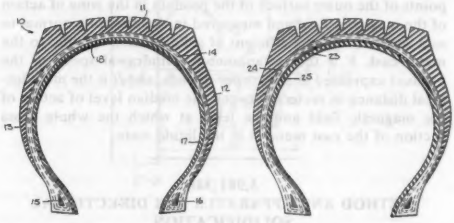
a width substantially equal to the width of said well less the width of said supporting member and not less than the width of one of said bead portions providing space at one side of said well for receiving one of said bead portions of the tire during mounting of the tire on said rim, a pair of supporting rings positioned at spaced-apart positions radially outward of said central supporting member and a pair of supporting arm members connecting said central supporting member and said rings, said rings having a diameter less than the diameter of said tread portion of the tire in the inflated condition and greater than the diameter of said bead portions for supporting engagement of said rings with said tire in the area of said shoulder portions in the deflated condition of said tire.

3,981,342

PUNCTURE SEALING COMPOSITION AND TIRE

Milton Farber, Bethany; Frederick C. Loveless, Cheshire, and Robert F. Peterson, Jr., Woodbury, all of Conn., assignors to Uniroyal Inc., New York, N.Y.

Filed Mar. 12, 1975, Ser. No. 557,713
Int. Cl.² B60C 21/08
U.S. Cl. 152—347 **28 Claims**



6. A puncture sealing composition for a tubeless pneumatic tire comprising a blend of from more than 50 to 90% by weight of a low molecular weight liquid elastomer which is liquid heat depolymerized natural rubber having a Brookfield viscosity at 150° F of from 20,000 to 200,000 cps with correspondingly from less than 50 to 10% by weight of a high molecular solid elastomer having a Mooney viscosity of from 20 to 160 ML-4 at 212° F., said blend being partially corss-linked to an extent sufficient to provide in the blend a gel content of from 15 to 60% by weight of the blend as measured in toluene at room temperature and an initial Mooney viscosity of from 30 to 70 ML at room temperature, whereby the blend is prevented from flowing at elevated temperatures and centrifugal forces encountered in the tire in use and the blend has sufficient adhesion and conformability to function as a sealant in the tire.

3,981,343

COUNTERBALANCING MECHANISM FOR ROLLING DOORS

George DeVito, Chicago, Ill., assignor to Arthur M. Brady, Chicago, Ill.

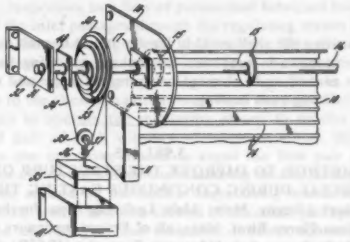
Filed Sept. 23, 1974, Ser. No. 508,404
Int. Cl.² E05F 15/20
U.S. Cl. 160—9 **7 Claims**

1. A door assembly comprising a standard rolling door comprising a multiplicity of articulated sections mounted for movement vertically along the plane of the doorway and into a stored overhead position above the top of the doorway when the door is opened, the weight of the vertical portion of the door producing variable forces urging the door toward its closed position as the door is moved between its open and closed positions, and a counterbalancing mechanism comprising the combination of:

a. a horizontal shaft rotatably mounted above the doorway and operably connected to said door, and a drum fixed to said shaft for rotation therewith in response to movement of the door between its open and closed positions, said drum having a spiral groove formed in the outer surface thereof for guiding a cable along the drum when the drum is rotated,

b. a cable connected to said drum and wrapped around said drum in said spiral groove in response to rotation of the drum in one direction and unwrapped from the drum in response to rotation in the opposite direction, the lengths of said cable and said spiral groove being such that the cable is completely unwrapped from the spiral groove when the door is in the open position,

c. and a constant counterbalance weight suspended from said cable directly adjacent the doorway for applying a torque to said drum, and thus applying a force to said door, urging the door toward its open position, the radius of curvature of said spiral groove about the axis of said



drum gradually decreasing along the length of the drum so that the torque arm between the axis of the drum and said cable gradually decreases as the door moves from its closed position to its open position for counterbalancing the variable forces urging the door toward its closed position, said radius of curvature decreasing at an increasing rate at the smaller end of the spiral drum so that the force applied to the door diminishes at an increasing rate as the door approaches the fully open position, said spiral groove terminating at about the outside diameter of the shaft in a radius of curvature that produces substantially zero torque on the drum, and thus the door, when the door is in its open position so that the door smoothly decelerates as it approaches said open position and is readily withdrawn from said open position for movement toward said closed position, said drum and weight providing the sole counterbalance for said door.

3,981,344

INVESTMENT CASTING MOLD AND PROCESS

Douglas R. Hayes, Vernon, Conn., and Charles M. Phipps, Ridgewood, N.J., assignors to United Technologies Corporation, Hartford, Conn.

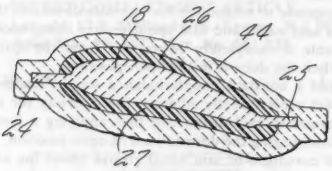
Filed Aug. 21, 1974, Ser. No. 499,227
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.² B22C 7/02, 9/22
U.S. Cl. 164—26 **15 Claims**

1. In the manufacture of a mold for use in precision casting of mating thin walled parts from high temperature alloys, the steps of

providing a precast, high strength central mold element of adequate strength to avoid deformation during heating and casting of the said mold element having article forming surfaces on opposite surfaces thereof and edge flanges extending beyond the article forming surfaces and the wax patterns,

positioning individual wax patterns on opposite sides of the element, one on each article forming surface of the element,

forming a shell mold around the assembled mold element including the edge flanges and the patterns on the element by successively dipping the element with the patterns thereon in a ceramic slurry, stuccoing with refractory particles to form a coating and drying the coating to form the desired shell thickness, and



heating the shell mold to harden it and to melt out the wax patterns in readiness for making a casting therein, the central mold element retaining its shape and dimension during such heating.

3,981,345

METHOD TO IMPROVE THE STRUCTURE OF CAST METAL DURING CONTINUOUS CASTING THEREOF

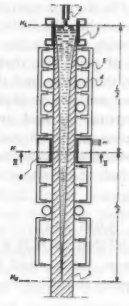
Robert Alberny, Metz; Alain Leclercq, Alpa Porcheville, and Jean-Pierre Birat, Metz, all of France, assignors to Institut de Recherces de la Siderurgie Francaise (IRSID), Saint-Germain-en-Laye, France

Filed May 21, 1974, Ser. No. 471,972

Claims priority, application France, May 21, 1973, 73.18329

Int. Cl.[2] B22D *27/02, 11/10*

U.S. Cl. 164—49 **4 Claims**



1. A method to control the structure of solidification of a continuously cast metal product in which the product is subjected during its solidification to the action of a rotating magnetic field produced by a bipolar inductor to provoke in a central still liquid portion of the product and at least in a zone bordering the inner surface of the already solidified outer skin a rotary movement of the liquid metal, said method comprising the steps of continuously discharging a stream of molten metal in downward direction; cooling the stream of molten metal to gradually solidify the same; continuously withdrawing the thus solidified metal; continuously measuring the speed at which the product is withdrawn; and regulating the intensity of the magnetic field as a function of variations of the withdrawal speeds so as to maintain constant a value a defined by the equation:

$$a = B_o \cdot e(V) \cdot \sqrt{\frac{f}{\rho}},$$

in which B_o is the effective value in Tesla of the induction in air in the region at the border of the solidified and liquid metal; f is the frequency in Hertz of the current supplied to the bipolar inductor producing the rotating magnetic field, the magnetic field produced corresponding to a magnetic field applied to a reference product of circular cross section of a diameter equal to the minimum width of the product cast and following the same law of solidification as the cast product; ρ is the resistivity of the liquid metal cast in Ωm; and $e(V)$ is the medium distance between two opposite points at the border between the still liquid and the already solidified metal in the zone of action of the magnetic field and measured in the direction normal to the outer surface of the cast product, said distance being defined by the equation:

$$e(V) = E - 2k \sqrt{\frac{H}{V}},$$

in which E is the distance in meters between two opposite points of the outer surface of the product in the zone of action of the magnetic field and measured in the direction normal to said surface, k is a coefficient of solidification specific to the metal cast, V is the instantaneous withdrawal speed of the product expressed in meters per minute, and H is the metallurgical distance in meters between the median level of action of the magnetic field and the level at which the whole cross section of the cast metal is in the liquid state.

3,981,346

METHOD AND APPARATUS FOR DIRECTIONAL SOLIDIFICATION

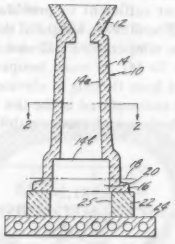
Douglas R. Hayes, Vernon, and James S. Perron, Chester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 3, 1974, Ser. No. 511,885

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.[2] B22D *25/06*

U.S. Cl. 164—60 **10 Claims**



1. Apparatus for making columnar grained articles including,

a chill plate for controlling the cooling of the mold and alloy therein,

a ceramic mold including an article portion having a cavity and a base portion having a cavity communicating with the cavity in the article portion,

a spacer ring of preformed ceramic material separate from the mold and positioned on said chill plate and on which the mold is positioned with the base portion resting on the spacer,

said spacer ring and mold providing a continuous cavity from the chill plate through the spacer and into and including the article portion cavity,

means surrounding the mold for heating the mold to a temperature substantially as high as the melting point of the alloy to be cast, and

the material and thickness of said spacer ring such that said ring is particularly resistant to damage by the steep thermal gradients developed during heating of the mold resting on the ring and simultaneous chilling of the ring by the chill plate, and said spacer ring serving to space the mold from the chill plate to reduce the thermal gradients therein.

3,981,347

METHOD AND APPARATUS FOR STRAND COOLING WITH A FLAT SPRAY PATTERN

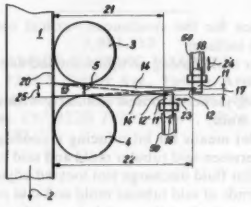
Fritz Willim, Birmensdorf, Switzerland, assignor to Concast AG, Zurich, Switzerland

Filed Apr. 21, 1975, Ser. No. 570,220

Claims priority, application Switzerland, Apr. 26, 1974, 5748/74

Int. Cl.² B22D *11/124*

U.S. Cl. 164—89 **12 Claims**



1. A method of cooling a strand during the continuous casting of metals, especially steel, comprising the steps of guiding the cast strand between neighboring spaced strand guide elements extending in the direction of travel of the strand, selectively spraying cooling fluid between two neighboring strand guide elements from two spray patterns which are essentially unidirectional onto the surface of the strand, said two spray patterns initially extending behind one another in the direction of travel of the strand and thereafter being united into a flat spray pattern, the thickness and direction of which approximately corresponds to that of one of the adjacently situated spray patterns.

3,981,348

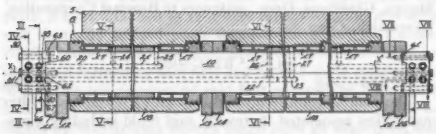
SUPPORT AND LUBRICATION SYSTEM FOR CONTINUOUS CASTING MACHINE ROLLERS

William A. Schmucker, Cedarburg, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 20, 1975, Ser. No. 623,599

Int. Cl.² B22D *11/14;* **F01M** *1/06;* **F16N** *25/02*

U.S. Cl. 164—149 **5 Claims**



1. A roller assembly for such as supporting a strand of metal cast in a continuous casting machine, with the roller assembly having a shaft adapted to be journaled in supporting arms at axially spaced locations along the shaft, a plurality of axially spaced bearings mounted on the outer periphery of the shaft, a plurality of axially spaced cylindrical roller shells mounted on the outer periphery of the bearings, at least one axial end of the shaft bored to define at least three axially inwardly projecting lubricating passages each in fluid communication with at least one radially extending lubrication passage located to deliver lubricant to one of the bearings, and including an improvement comprising a lubricant measuring and distributing valve assembly mounted on the end of the shaft so bored, with the valve assembly comprising:

a. a body defining a pair of lubricant inlet passages for alternately receiving a pressurized lubricant according to a predetermined time sequence, and at least three outlets for discharging lubricant from the valve body in the shaft passages;

b. means provided within the body and connected to each of the inlet passages for regulating the admission of lubricant;

c. means provided within the body and connected to the regulating means for measuring four predetermined volumes of admitted lubricant; and

d. operating means within the lubricant volume measuring means, responsive to a flow of pressurized lubricant from one of the inlet passages through the regulating means to operate the measuring means to receive a first pair of predetermined volumes of lubricant from the regulating means, after which the operating means operates in response to the alternating of pressure from the pair of inlet passages to operate the measuring means to receive a second pair of such volumes of lubricant which then actuate the operating means to expel the first pair of volumes of lubricant from the measuring means through first and second of the outlets respectively which are connected with a first and second of the shaft passages, and the operating means thereafter receives lubricant from the regulating means to replace the expelled first pair of volumes and such admission of lubricant actuates the operating means to expel the second pair of volumes of lubricant through at least a third outlet which is connected with a third shaft passage.

3,981,349

ELECTROSLAG REMELTING PLANT

Boris Izrailevich Medovar, ulitsa A.Barbjusa, 22/26, kv. 109, Kiev; Vladimir Yakovlevich Saenko, Kharkovskoe shosse, 18, kv. 71, Kiev; Grigory Bentsionovich Schupak, ulitsa Chudnovskogo, 7, kv. 61, Kiev; Jury Fedorovich Alferov, bulvar Lepse, 29, kv. 64, Kiev; Vladimir Fedorovich Karpov, prospekt Metallurgov, 213/3 kv. 18, Zhdanov Donetskoi oblasti; Kirill Adolfovich Berman, ulitsa Pirogova, 67, kv. 68, Zhdanov Donetskoi oblasti; Vitaly Vasilievich Pogoretsky, ulitsa Pushkina, 66, Zhdanov Donetskoi oblasti; Vitaly Alexandrovich Ovseichuk, perevlok Vesely, 5a, kv. 18, Korsakov Sakhalinskoi oblasti; Petr Stepanovich Zabolotsky, bulvar Shevchenko, 248, kv. 124, Zhdanov Donetskoi oblasti; Georgy Alexandrovich Boiko, ulitsa Vladimiro-Lybedskaya, 16, kv. 106, Kiev; Vladimir Ivanovich Oleinik, ulitsa Entuziastov, 29/1, kv. 38, Kiev; Stanislav Vitalievich Grodzitsky, ulitsa Matejuka, 5, kv. 190, Kiev; Viktor Andreevich Popov, ulitsa Andreevskaya 11, kv. 2, Kiev, and Anatoly Ivanovich Chvertko, bulvar Lesi Ukrainki, 2, kv. 10, Kiev, all of U.S.S.R.

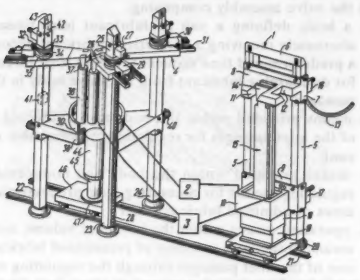
Filed Sept. 19, 1975, Ser. No. 615,076

Int. Cl.² B22D *27/02*

U.S. Cl. 164—252 **2 Claims**

1. An electroslag remelting plant, comprising molds with a base plate; a double-mast single-phase furnace with a water-cooling and a gas suction system; electrode holders arranged on each of said masts; a three-mast three-phase electroslag remelting furnace connected directly to said water-cooling and gas suction systems of the double-mast single-phase fur-

nace; at least one of the masts of said three-mast three-phase furnace on which the electrode holder is fixed is arranged at



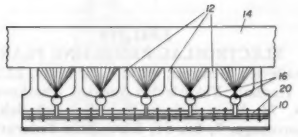
such a distance from the double-mast single-phase furnace which ensures the melting of an ingot into a common mold.

3,981,350

APPARATUS FOR SUPPORTING AND COOLING A CONTINUOUSLY CAST PRODUCT

Alain Chielens, Marcq en Baroeul, and Jean Pierre Henin, Lille, both of France, assignors to Fives-Cail Babcock, Paris, France

Filed Mar. 10, 1975, Ser. No. 556,878
Claims priority, application France, Mar. 8, 1974, 74.07923
Int. Cl.² B22D *11/14*; B65G *11/18*; F27B *3/12*
U.S. Cl. 164—283 R 24 Claims



1. An apparatus for supporting and cooling a continuously cast product having a surface while the product is displaced along a path, comprising

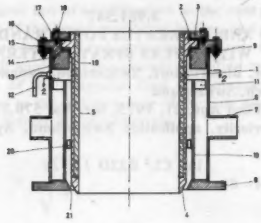
1. a series of substantially identical support bars extending substantially parallel to each other in a direction transverse to the path of displacement,
   a. the support bars being dismountably assembled to form a panel, and
   b. each bar including a portion of rectangular cross section having a large face and a small face, the large face extending perpendicularly to the surface of the cast product and the small face being arranged in contact with the surface of the cast product to support the product, the width of the small faces of the bar portions being substantially less than the spacing therebetween; and
2. elongated means for spraying a cooling fluid disposed substantially parallel to each other on the panel and between the support bars, the elongated spraying means being supported by the panel.

3,981,351

MOLD FOR THE CONTINUOUS VERTICAL CASTING OF BILLETS

John Dompas, Olen, Belgium, assignor to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Filed Nov. 13, 1974, Ser. No. 523,405
Claims priority, application Luxemburg, Nov. 26, 1973, 68861
Int. Cl.² B22D *11/124*
U.S. Cl. 164—283 R 13 Claims



1. A device for the continuous vertical casting of metal billets which includes

a. a tubular mold having an upstream end and a downstream end,
b. a cooling jacket disposed annularly with respect to said tubular mold,
c. fluid inlet means for introducing a cooling fluid into the space between said tubular mold and said cooling jacket,
d. an annular fluid discharge slot located adjacent the downstream ends of said tubular mold and said cooling jacket,
e. a tubular member disposed between the exterior of said tubular mold and the interior of said cooling jacket and extending upwardly an axial distance less than said mold and said cooling jacket,
f. a plurality of rib members extending outwardly from the upper part of said tubular member toward the inner wall of said cooling jacket so as to thereby form a plurality of flow channels, and
g. a passageway extending from said fluid inlet means, past said rib members, around the end of said tubular member and then to said annular fluid discharge slot, whereby when fluid is introduced into said fluid inlet means it will flow in the space between the inner wall of said cooling jacket and the outer wall of said tubular member toward the upstream end of said tubular mold, be divided into a plurality of flow streams by said rib members, and then flow in a laminar streams between the inner wall of said tubular member and the outer wall of said tubular mold toward said annular fluid discharge slot.

3,981,352

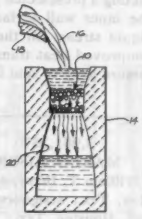
METAL CASTING MOLD WITH BONDED PARTICLE FILTER

John I. Nurminen, North Muskegon, Mich., and David H. Sturgis, Gladstone, Oreg., assignors to Howmet Corporation, Greenwich, Conn.

Filed Nov. 21, 1975, Ser. No. 634,045
Int. Cl.² B22C *9/08*
U.S. Cl. 164—358 5 Claims

1. The combination of a mold for casting metal and a filter construction associated therewith, said mold including a passage for the introduction of molten metal into a mold cavity, said filter being located in said passage whereby the molten metal passes through the filter during filling of the mold, the improvement wherein said filter comprises a multiplicity of substantially spherical, refractory particles, and a ceramic binder securing said particles in bonded assembly, said binder substantially completely coating the particles, openings defined between the coated particles to permit the flow of mol-

ten metal through the filter, said binder having an affinity for inclusions in the molten metal including dross and slag constituents whereby such inclusions are removed during passage of metal through the filter.



3,981,353

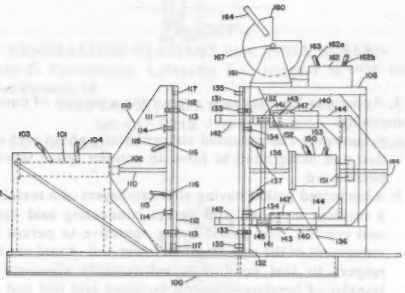
ANODE CASTING MACHINE

Bill J. Knight, 7315 S. Settler Ave., Tucson, Ariz. 85706

Filed Jan. 16, 1975, Ser. No. 532,491

Int. Cl.² B22D *19/00, 41/04, 17/26*

U.S. Cl. 164—332 **31 Claims**



1. An anode casting machine for casting metal anodes comprising a base means, a first open faced mold plate, a first backing plate operably connected to said first open faced mold plate, a second open faced mold plate, a second backing plate operably connected to said second open faced mold plate, means attached to said base means to unite and secure said first and second open faced mold plates into a mold configuration, ladle means for introducing molten metal into said mold formed by said first and second mold plates, means to stabilize temperature of said first and second mold plates, means for separating said first and second mold plates and means for transferring molten metal from an associated melting pot to said ladle means, said ladle means for introducing molten metal into said mold configuration comprising rotatable cylinder means having axle means at each end, said axle means operably connected to support means connected to said base means, said cylinder having openings along the circumference and parallel with the longitudinal axis cylinder, whereby said cylinder when filled with molten metal may be rotated until said molten metal pours from said openings.

3,981,354

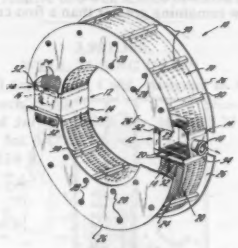
BUILT-UP TUBE AND TUBESHEET ASSEMBLY FOR MULTI-CONDUIT HEAT EXCHANGERS

Richard J. Haberski, Emerson, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Mar. 28, 1975, Ser. No. 563,089

Int. Cl.² F28F *7/00*

U.S. Cl. 165—79 **11 Claims**



1. A tube and tubesheet assembly for a heat exchanger having a plurality of tube elements of non-circular cross-section comprising:

a. plurality of peripheral wall elements secured together to form an enclosure;

b. at least one partition wall element disposed in said enclosure and secured at opposite ends to said peripheral walls to divide said enclosure into tube element receiving openings;

c. said tube elements having end portions disposed in said openings;

d. spacer means coacting with said tube elements and said peripheral and partition walls adjacent thereto to position said tube elements in a predetermined close spaced relationship with said adjacent peripheral and partition walls; and

e. securing means for connecting said tube elements and said peripheral and partition wall elements together and for sealing the interstices between the end portions of the tube elements and the adjacent peripheral and partition wall elements.

3,981,355

SOLID-GAS HEAT EXCHANGE METHOD IN COUNTERCURRENT CONTACTING OF GAS AND GRANULAR MATERIAL IN PANEL BED

Arthur M. Squires, 245 W. 104 St., New York, N.Y. 10025

Filed Sept. 19, 1974, Ser. No. 507,398

Int. Cl.² F25B *13/00*

U.S. Cl. 165—2 **15 Claims**

1. A method for solid-gas heat exchange in countercurrent contacting of gas and granular material in a panel bed comprising:

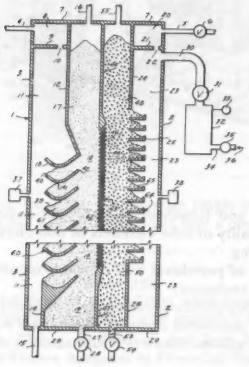
a. arranging granular material at a given temperature in a bed having a plurality of transversely disposed upwardly spaced gas entry portions separated by interposed supporting members having outer and inner edges with respect to the bed wherein said gas entry portions have gas entry faces with outer edges substantially contiguous with said outer edges of said supporting members and wherein a supporting member is gently curved and inclines downwardly and inwardly from its outer edge and then upwardly and inwardly toward its inner edge and wherein the inner edge of a typical supporting member is above the inner edge of the gas entry face supported by the member, and wherein said bed has gas exit portions spaced from said inner edges of said supporting members;

b. forwardly flowing gas at a different temperature in a substantially continuing flow during said heat exchange

through the gas entry portions of the granular material bed and outwardly from the gas exit portions to exchange heat between said gas and said granular material; and

c. thereafter causing a transient flow of an auxiliary gas to move in the direction in reverse to the flow of said gas in (b);

d. said transient reverse flow producing first a rise at a given rate of rise and subsequently a fall in the pressure difference between said gas exit portions and said gas entry portions, said difference produced by said transient reverse flow remaining greater than a first critical minimum



difference for a time interval less than about 150 milliseconds, said first critical difference being that difference at which a steady flow of gas in said reverse direction just produces a localized spill of granular material from said gas entry faces, and said difference produced by said transient reverse flow peaking to a top value beyond a second critical minimum difference, which is the pressure difference at which a transient flow of gas in said reverse direction producing said pressure difference at said rate of rise just initiates a body movement of the granular material toward said gas entry faces to spill a portion of the granular material from the bed.

3,981,356

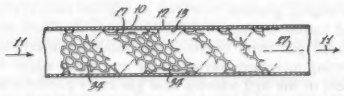
HEAT EXCHANGER

Dennis C. Granetzke, Racine, Wis., assignor to Modine Manufacturing Company, Racine, Wis.

Filed June 6, 1975, Ser. No. 584,632

Int. Cl.² F28F 1/42

U.S. Cl. 165—179 **7 Claims**



1. A heat exchanger, comprising: a heat exchange tube for flow of a heat exchange liquid therethrough; and a turbulator on the interior of said tube and in contact with the inner surface of the tube wall, said turbulator comprising an expanded metal member arranged in a flat helix comprising coils located adjacent and substantially parallel to said wall surface, and having side edges with spacing projections integral with the expanded metal, said projections extending outwardly of said helix coils and in contact with the inner surface of the tube for spacing the expanded metal helix turbulator from the tube inner surface, said expanded metal comprising separated strands defining openings through the metal and connecting bridges for said strands with the strands and bridges having side surface means at an angle to said helix and thus to said wall surface for directing a preselected portion of the liquid in the tube toward the inner wall surface and the remainder toward the main liquid stream on the interior of the tube, thereby achieving improved heat transfer through said tube wall with minor pressure drop of said liquid flow through the tube.

3,981,357

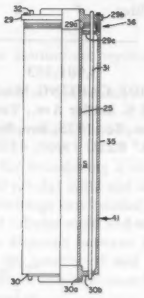
MARINE RISER

James M. Walker; William T. Ilfrey, and Philippe H. Schaeffer, all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Feb. 3, 1975, Ser. No. 546,490

Int. Cl.² E21B 7/12

U.S. Cl. 166—.5 **3 Claims**



3. Apparatus for buoyantly supporting a section of conduit comprising:

a. a buoyancy can mounted concentrically about said conduit and being sized to form an annular space therebetween; and

b. a laminated gasket having alternate layers of a metal and a resilient material, said gasket connecting said can to said conduit, said gasket being operative to permit free movement of the non-attached lower end of said can with respect to said conduit to substantially eliminate the transfer of bending moments between said can and said conduit upon bending movement of said conduit.

3,981,358

WELL SAFETY VALVE

Fred E. Watkins, Houston, Tex., and James R. Reaux, New Orleans, La., assignors to Camco, Incorporated, Houston, Tex.

Filed Nov. 14, 1975, Ser. No. 632,032

Int. Cl.² E21B 43/12

U.S. Cl. 166—224 A **7 Claims**

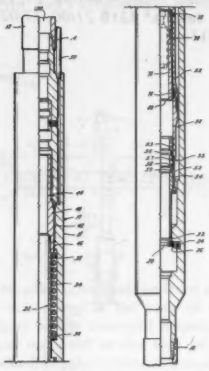
1. In a well safety valve for controlling the fluid flow through a well tubing, the valve adapted to be positioned in the well tubing and having a valve closure member moving between open and closed positions, a longitudinally movable tubular member for controlling the movement of the valve closure member, first means for moving the tubular member in a first direction, second means for moving the tubular member in a second direction, the improvement comprising,

said tubular member including a first upper and a second lower telescoping section,

releasable locking means normally securing the telescoping sections together, and releasable means constructed to

release upon the application of a predetermined force less than a force sufficient to cause damage to the valve,

said releasable locking means normally securing the telescoping sections in an intermediate extended position whereby upon the application of said predetermined



force, said sections will telescope towards each other preventing damage to said valve, and

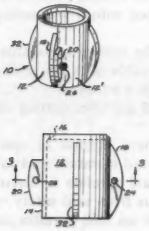
tool engaging means on the second telescoping section for extending said section downwardly for opening the valve closure member.

3,981,359

CENTRALIZER ELEMENT FOR WELL SCREEN

Dewitt L. Fortenberry, Lafayette, La., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 21, 1975, Ser. No. 624,511
Int. Cl.² E21B *17/10, 43/10*
U.S. Cl. 166—241 **2 Claims**



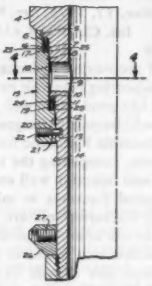
1. A centralizer for axially centering a well screen within a tubular well casing, said centralizer comprising a pair of identical housing portions having a generally semi-cylindrical, annular wall cross-section along substantially the entire axial length thereof, one end of said wall having an integral, inwardly extending lip portion formed thereon, a pair of integral, outwardly extending flange portions formed in a common plane and extending from each side edge of said housing portions, each one of said pair of flange portions having an aperture therein so that when a pair of housing portions are positioned opposite each other and in surrounding relation to a well screen, fastener members can pass through said apertures to clamp said housing portions together, and an outwardly extending flange portion on each housing portion arranged between said pair of flange portions, each of said flange portions extending about the same distance from the inner wall of said housing portions so as to center a well screen to which said housing portions are adapted to be clamped within a well casing which is just slightly larger in internal diameter than the distance between the tips of any pair of flange portions lying in a common plane, said lip portions being adapted to fit into a recessed area of limited axial extent adjacent the end of a well screen to prevent axial shifting of said centralizer relative to a well screen to which it is clamped.

3,981,360

WELL TUBING DRAIN

Anil Marathe, Long Beach, Calif., assignor to Cook Testing Co., Long Beach, Calif.

Filed July 30, 1975, Ser. No. 600,213
Int. Cl.² E21B *33/16, 33/134*
U.S. Cl. 166—224 R **8 Claims**



1. A drain for a well tubing string, comprising:

a. a tubular mandrel member having at least one lateral port and adapted to be interposed between sections of a tubing string;

b. an axially movable annular sleeve member surrounding the mandrel member;

c. at least one shear pin connecting the sleeve and mandrel to restrain the sleeve against axial displacement;

d. a pair of axially spaced annular seal means disposed between the sleeve member and mandrel member isolating and sealing the port each of the seal means presenting a pressure responsive area, and one being of larger diameter than the other whereby both pressure areas are operable to apply a shearing load in the same direction on the shear pin;

e. and at least one of the seal means presenting an axially directed annular pressure responsive area, exposed to the interior of the mandrel member through the port and responsive to a predetermined fluid pressure in the mandrel member to exert a shearing load on the shear pin permitting downward axial displacement of the sleeve member to expose the port.

3,981,361

OIL RECOVERY METHOD USING MICROEMULSIONS

Robert N. Healy, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed July 31, 1975, Ser. No. 601,126
Int. Cl.² E21B *43/22*
U.S. Cl. 166—252 **19 Claims**

1. A method of recovering oil from a subterranean formation containing formation oil and formation water which comprises:

a. combining an oil having physical and chemical characteristics approximately the same as the formation oil, an aqueous medium having physical and chemical character-

istics approximately the same as the formation water, and a surfactant to form a microemulsion and at least one liquid phase which is immiscible with said microemulsion;

b. determining the ratio of the volume of said immiscible liquid phase in said microemulsion to the volume of the surfactant in said microemulsion;

c. selecting a microemulsion having a volumetric ratio greater than 0.5; and

d. injecting a microemulsion containing an oil, an aqueous medium and a surfactant each having physical and chemical characteristics substantially the same as the oil, aqueous medium, and surfactant contained in said selected microemulsion into said formation to recover oil.

3,981,362

IN-SITU COMBUSTION METHOD FOR THE RECOVERY OF HYDROCARBONS

Joseph C. Allen, Bellaire, and Fuad T. Saadeh, Houston, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 17, 1975, Ser. No. 558,869

Int. Cl.² E21B *43/24*

U.S. Cl. 166—260 **7 Claims**

1. A method of recovering hydrocarbons from a subterranean hydrocarbon-bearing reservoir penetrated by at least one injection well and one production well, utilizing a hot inert gas drive, said reservoir having undergone hydraulic fracturing employing a combustible hydraulic fracturing mixture to create fractures therein, comprising the steps of:

a. injecting via said injection well an oxygen-containing gas into said created fractures in said reservoir containing said hydraulic fracturing mixture,

b. initiating an in-situ combustion of said hydraulic fracturing mixture within said fractures of said reservoir,

c. continuing injection of said oxygen-containing gas to combust said fracturing mixture to attain a temperature in said fractures in the range of at least 650° to 750°F,

d. injecting via said injection well a stream of fluidized carbon in an inert gas carrier and simultaneously continuing injection of said oxygen-containing gas thereby causing combustion of said fluidized carbon in said fractures whereby minimum formation of water of combustion is achieved,

e. terminating injection of said stream of fluidized carbon in an inert gas carrier and said oxygen-containing gas after a sufficient amount of heat has been generated by said combustion such that said reservoir hydrocarbons have been rendered mobile,

f. injecting via said injection well an inert gas to provide a hot inert gas drive in said reservoir,

g. producing said reservoir hydrocarbons via said production well.

3,981,363

PARTIALLY CROSSLINKED POLYMER USED IN CORRECTING SUBTERRANEAN FORMATION PERMEABILITY

James W. Gall, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 6, 1975, Ser. No. 629,357

Int. Cl.² E21B *43/22, 33/138*

U.S. Cl. 166—270 **9 Claims**

1. A method for treating a subterranean formation which is penetrated by at least one well bore, comprising:

a. injecting into the formation through a well bore a first aqueous solution of partially crosslinked polymer;

b. thereafter injecting a complexing ionic solution of multivalent cations and retarding ion; and

c. thereafter injecting into the formation through the well bore a second aqueous solution of partially crosslinked polymer.

3,981,364

WELL TUBING PARAFFIN CUTTING APPARATUS AND METHOD OF OPERATION

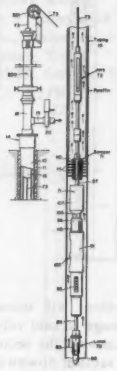
Darrell G. Warner, New Orleans, and William D. Loth, Covington, both of La., assignors to Exxon Production Research Company, Houston, Tex.

Filed Oct. 2, 1974, Ser. No. 511,156

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² E21B *21/00, 37/02*

U.S. Cl. 166—311 **16 Claims**



1. A paraffin cutter for use in removing paraffin from a well tubing comprising a stationary wireline operated subsurface safety valve;

means for releasably connecting said paraffin cutter to said subsurface safety valve and

for permitting sufficient tension to be applied to said subsurface safety valve to maintain said subsurface safety valve open while said paraffin cutter and said subsurface safety valve remain connected together.

11. A method for cutting paraffin from a tubing containing a wireline operated subsurface safety valve comprising the steps of:

lowering paraffin cutting apparatus containing cutting elements engageable with the wall of said tubing through said tubing on a wireline;

connecting said paraffin cutting apparatus to said safety valve;

applying sufficient tension to said wireline to open said safety valve and maintain said safety valve open;

manipulating said wireline to disconnect said paraffin cutting apparatus from said safety valve and to expose cutting elements on said paraffin cutting apparatus for engagement with the wall of said tubing; and

pulling said paraffin cutting apparatus upwardly through said tubing by said wireline with said cutting elements in engagement with the wall of said tubing.

3,981,365

ROCK GATHERING MACHINE

Carl R. Arnold, and Charles D. Arnold, both of Marion, Iowa, assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 10, 1975, Ser. No. 556,689

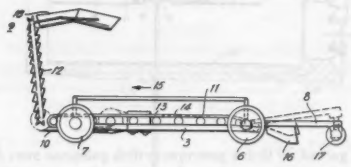
Int. Cl.² A01B *43/00*

U.S. Cl. 171—63 **2 Claims**

1. A rock gathering machine for picking rocks up off the ground, said rock gathering machine comprising

a vehicle movable over land;

conveyor means mounted on the vehicle for transporting rocks from the front of the vehicle to an elevated point at the rear of the vehicle, said conveyor means comprising endless belt means having a plurality of spaced rod-like members transverse to the direction of movement of the belt means whereby small stones and dirt fall onto the land under the vehicle, a substantially horizontal section of the conveyor, and a substantially vertical section of the conveyor;



rock catching means mounted at the front of the vehicle for picking up rocks lying in the path of the vehicle and depositing them on the conveyor means; and

removing means mounted at the rear of the vehicle for removing rocks from the conveyor means and depositing them in a desired area relative to the vehicle, said removing means comprising sleeve means directing rocks from the vertical section to an area alongside the vehicle.

3,981,366

SOIL CULTIVATOR

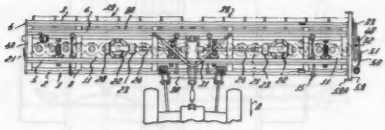
Cornelis van der Lely, 7 Bruschenrain, Zug, Switzerland; Ary van der Lely, 10, Weverskade, Maasland, and Cornelis Johannes Gerardus Bom, 36, Esdoornlaan, Rozenburg, both of Netherlands

Division of Ser. No. 369,907, June 14, 1973, Pat. No. 3,885,633. This application Mar. 24, 1975, Ser. No. 561,228

Claims priority, application Netherlands, Apr. 18, 1973, 7305416

Int. Cl.² A01B *33/06, 23/04*

U.S. Cl. 172—59 **7 Claims**



1. A cultivator or harrow implement comprising frame means and a plurality of soil-working members rotatably mounted on upwardly extending axes with driving means connected to said members to rotate same, said frame means including a supporting frame that supports said soil-working members and driving means, said supporting frame comprising four beams and said beams extending generally parallel to one another, transverse to the normal direction of operative travel of said implement, said beams being arranged in pairs at different levels above the ground and means interconnecting said beams with one another, a leading beam of the lowermost pair being located at a lower level than a rearward beam of that pair, a foremost beam of the uppermost pair being located at a higher level than a rearmost beam of the uppermost pair, the distance between the beams of said lowermost pair being greater than the distance between the beams of said uppermost pair.

3,981,367

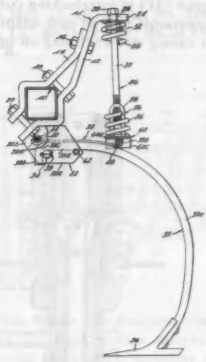
SPRING TRIP CULTIVATOR SHANK ASSEMBLY

John W. Mydels, La Porte, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 29, 1975, Ser. No. 617,935

Int. Cl.² A01B *61/04*

U.S. Cl. 172—265 **12 Claims**



1. A spring trip cultivator shank assembly adapted to be supported from a bracket structure carried by the transverse tool bar of a cultivator apparatus, comprising a pair of downwardly extending side plates positioned contiguous the forward end of said assembly, said side plates being spaced laterally from each other but longitudinally of said tool bar, a cultivator shank adapted to support a cultivator tool contiguous the lower end thereof, the upper forward end of said cultivator shank extending between said side plates and including a pivot part, horizontally extending pivot means carried by said side plates engaging said pivot part to accomodate pivotal movement of said cultivator shank in a vertical plane, an abutment member received between said side plates and bearing against said cultivator shank to hold said cultivator shank against said pivot means, said abutment member extending beyond and rearwardly of said side plates in overlying abutting relation to the upper surface of said cultivator shank, a loading spring subassembly supported from a rearwardly extending portion of said bracket structure, the lower end of said loading spring subassembly bearing against a rearward portion of said abutment member whereby to transmit through said abutment member a downward loading force to said cultivator shank, said loading spring subassembly including a compression spring which is compressible to permit upward pivotal movement of said cultivator shank when said cultivator tool carried by said shank encounters an obstacle such as a rock.

3,981,368

COUPLING MEANS IN A DRILLING MACHINE

Hans Per Olof Lundstrom, and Ernst Lennart Johansson, both of Sandviken, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Dec. 31, 1974, Ser. No. 537,709

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² B25D *9/00*

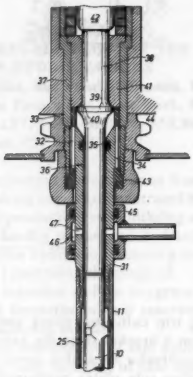
U.S. Cl. 173—104 **5 Claims**

1. A rock drilling equipment of the character having an impact and rotary force-transmitting device for use with a percussive type drill motor having a reciprocal piston delivering percussive force, said equipment comprising:

a rotatable tube (11), said tube being composed of a plurality of sections connected in end to end relation, one end section of which is connected to said drill motor and the other end section being connected to a drill bit;

a rod (10) being in sections connected in end to end relation, said rod being slidable within said tube, one end of said rod having a force-receiving surface and the other end having a force-transmitting surface to transmit only longitudinal forces to said bit;

a tubular adapter (31) in interlocking connection with said tube, the uppermost part of said adapter being received in a tubular casing and enclosing an uppermost rod section (36), the latter being adapted to transmit percussion force from said reciprocal piston (42) to said drill bit,



said adapter being provided with longitudinally extending connection means (32) around its circumference; and

a coupling member (33), rotatable by said drill motor, said coupling member being provided with corresponding connection means to mate circumferentially with said adapter within said casing for transmitting only rotary motion to said tube and said bit,

said mating being effected with clearance such that said tube is able to take angular positions relative to said casing.

3,981,369

RISER PIPE STACKING SYSTEM

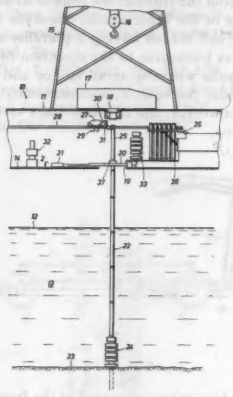
Donald G. Bokenkamp, Houston, Tex., assignor to Dolphin International, Inc., Houston, Tex.

Division of Ser. No. 434,651, Jan. 18, 1974, Pat. No. 3,895,677. This application Mar. 31, 1975, Ser. No. 563,736

Int. Cl.² E21B *19/00*

U.S. Cl. 175—5 **10 Claims**

1. In an offshore drilling rig, a supporting mechanism for selectively supporting well tool elements of differing cross-sections where each such element has means for providing a downwardly facing abutment surface, said supporting mechanism being attached to a horizontal floor having an opening therein, means for moving said supporting mechanism horizontally relative to said floor between a retracted position leaving the opening unobstructed and an extended position over said opening, said supporting mechanism including superimposed supporting devices having upwardly facing abutment surfaces for respectively engaging downwardly facing abutment surfaces for a large cross-section well tool element and for a smaller cross-section well tool element, said supporting device for a large cross-section well tool being movable independently of said other supporting device, and means for releasably coupling said supporting devices to one another for



conjoint movement whereby a smaller cross-section well tool can be supported in said opening.

3,981,370

DISC CUTTING UNIT FOR USE ON ROCK BORING MACHINES

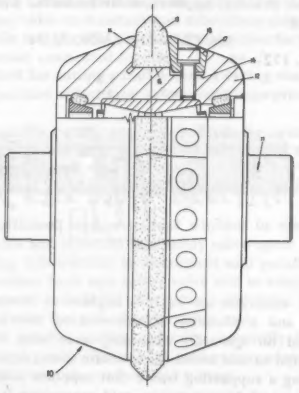
Henry Bingham; John Gilmour Glassford, both of Springs, Transvaal, and Noel Cuthbert Pope, Johannesburg, Transvaal, all of South Africa, assignors to Hard Metals Limited, Johannesburg, South Africa

Filed May 31, 1973, Ser. No. 365,682

Claims priority, application South Africa, June 2, 1972, 72/3776

Int. Cl.² E21B *9/14, 9/36*

U.S. Cl. 175—373 **6 Claims**



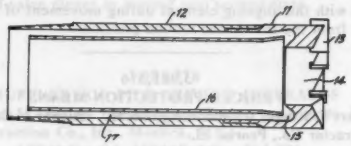
1. A rock-boring machine of the type comprising a rotatable headplate having a plurality of disc cutting units mounted on the front face of the headplate; each disc cutting unit comprising a base adapted to be secured to the front face of the headplate, a bearing shaft mounted on the base, an annular body journalled for rotation on the bearing shaft and having a continuous recess extending around its periphery, a plurality of cutting segments located in the recess to extend around the periphery of the body, and removable clamping means adapted to secure the cutting segments in the recess.

3,981,371

CORE SAMPLING DRILL

Jamie Malcolm Wallis, Morrison Road, Midvale, Western Australia, Australia

Filed June 6, 1975, Ser. No. 584,491
Int. Cl.² E21B 49/00
U.S. Cl. 175—403 1 Claim



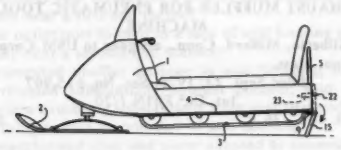
1. A core sampling drill comprising a drill bit having a lower end with a series of cutting surfaces arranged around a central core hole, the upper end of the drill bit being threaded so that it can be fitted to the lower end of a tubular drill stem, a core tube positioned within the lower end of the drill substantially concentric therewith and spaced apart therefrom to provide an outer annular air passage, the inner portion of the outer wall of the drill bit being provided with an annular recess which is arcuate in cross-section so that air flowing downwardly through the outer annular passage is turned through approximately 180° and directed upwardly into the core tube so that the material cut by the drill bit is entrained therein and carried into the core tube, said core tube being substantially cylindrical over its entire length and including a lower end portion which is conically flared and has an end extremity immediately proximate said annular recess and facing radially thereto.

3,981,372

MOTORIZED SNOW VEHICLE STAND

Lorenzo Moreau, 2275 Highway 69N, Box 331, Site 10, RR 2, Val Caron, Ontario, Canada

Filed Mar. 31, 1975, Ser. No. 563,674
Int. Cl.² B62D 55/08
U.S. Cl. 180—5 R 3 Claims



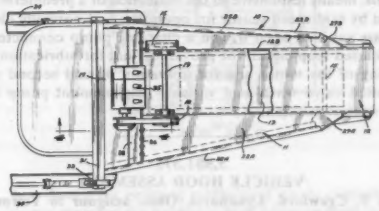
1. For a motorized snow vehicle, a stand comprising a pivot bar attachable in transverse horizontal position across the rear of a motorized snow vehicle; means securing said bar in nonrotatable relation; a U-shaped bail having a spaced pair of parallel arms with a sleeve on the free end of each arm of said bail rotatably mounted on said bar; means normally holding said bail in raised inoperative position against the rear of the vehicle; and a spring biased between said nonrotatable bar and said bail acting to swing said bail downwardly into operative ground-engaging position beneath the vehicle, said bar having a threaded bore in each end, a bolt threaded in each said bore with a vehicle mounting bracket secured on the outer end of each said bolt, whereby the spread of the brackets is adjustable to the width of the vehicle frame and wherein each said bolt loosely carries a washer engageable with the near end of said bar and a jamb nut threaded on said bolt between said washer and said mounting bracket for tightening said washer against the end of the bar thereby capturing the bail arm sleeves on the bar and securing the bar against turning relative to said mounting brackets.

3,981,373

UNITARY FRAME AND ENGINE SUPPORT FOR SNOWMOBILE

Gerald O. Irvine, Crosby, Minn., assignor to Scorpion, Inc., Crosby, Minn.

Filed May 23, 1975, Ser. No. 580,299
Int. Cl.² B62M 27/00, B62D 27/02
U.S. Cl. 180—5 R 9 Claims



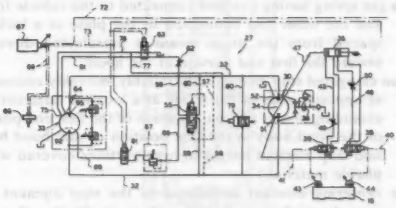
1. A snowmobile frame construction comprising a main housing including a tunnel portion adapted to house and mount a snowmobile drive track including a forward frame comprising a pair of vertical flange means, one on each side of the tunnel portion extending at least partially coextensively with and also forwardly of said tunnel portion and being spaced laterally outwardly from said tunnel portion a sufficient distance to permit an engine and torque converter assembly of the snowmobile to be positioned between said vertical flange means and forwardly of said tunnel portion, a front axle assembly structurally attached to the forward ends of both of said vertical flange means and ahead of a substantial portion of the engine of the snowmobile, and structural reinforcing means between both of said vertical flange means and the forward end of said tunnel portion, said structural reinforcing means including a panel member of substantial vertical depth structurally connected to said vertical flange means to transmit loads from said vertical flange means to said tunnel portion, and means to structurally connect the rearward portions of said vertical flange means to the tunnel portion.

3,981,374

HYDRAULIC DRIVE ASSIST FOR SCRAPERS

Robert C. Johns, Jr., Lubbock, Tex., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Nov. 13, 1974, Ser. No. 523,308
Int. Cl.² B62D 59/04
U.S. Cl. 180—14 A 2 Claims



1. A hydraulic drive for a ground vehicle having wheels propelled by an engine and other wheels driven by the hydraulic drive during predetermined conditions for assisting the engine propelled wheels, comprising a variable displacement pump driven by the engine, a hydraulic motor connected to

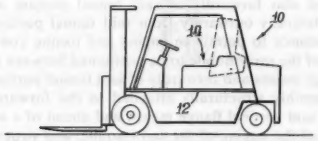
said pump in a closed loop hydraulic circuit, said pump having means displaceable in either direction from a neutral position for pressurizing the pump and driving said motor selectively in either forward or reverse drive mode, a normally closed pilot operated by-pass valve connected between the sides of said closed loop circuit to form a short loop circuit by-passing the motor when said by-pass valve is open, a second pilot operated valve actuated by the operating pressure in said closed loop hydraulic circuit downstream from said short loop circuit, said second pilot operated valve connected for operation by a pressure differential between the opposite sides of said closed loop circuit for putting the motor in the drive mode for either forward or reverse operation, a speed sensor driven at a speed proportional to the ground speed of the hydraulically driven wheels, means responsive to the indication of a predetermined speed by said speed sensor for operating said normally closed by-pass valve to open it, and a charging pump connected to said closed loop circuit for providing fluid for lubrication and cooling of the motor and for operation of said second pilot operated valve when said variable displacement pump is in said neutral position.

3,981,375

VEHICLE HOOD ASSEMBLY

John T. Crawford, Lyndhurst, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Nov. 3, 1975, Ser. No. 628,683
Int. Cl.² B62D *25/10*
U.S. Cl. 180—69 C **1 Claim**



1. A hood assembly of a vehicle having a frame, comprising:

a hood body having first and second end portions and being of a construction sufficient for covering a preselected portion of the vehicle;

means adjacent the second end portion for pivoting the hood body between a first position overlying the preselected portion of the vehicle and a second position at which portions of the hood body are positioned laterally from said preselected vehicle portion and the hood extends generally vertically from the vehicle, said pivot means being of a construction for pivoting the hood at about a single median location of the height of the hood body;

a plate connected to the second portion of the hood body adjacent the pivot means and extending toward the first end portion of the hood;

a gas spring having one end connected to the vehicle frame and the other end connected to the plate at a location spaced from the pivot means a preselected direction toward the first end portion of the hood;

an elongated stop element controllably, movably connected at opposite ends to the frame at a location adjacent and extending across at least a portion of the first end portion of the hood body in the first position of said hood body, said stop element having at least portions covered with a pliable material;

a centering element connected to the stop element and extending substantially vertically upwardly therefrom;

a supporting bracket connected to the first end portion of the hood and extending from said hood first end portion toward the second end portion of the hood; and

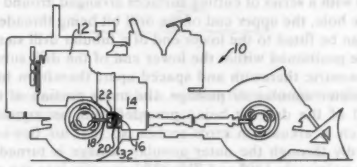
an elongated aligning element having a generally inverted "V" cross-sectional configuration and a tapered opening extending therethrough and being controllably, movably connected to the supporting bracket for receiving the centering element and contacting the stop element at the first position of the hood, said elongated aligning element being controllably positionable on the supporting bracket and said stop element being controllably positionable on the frame and said stop and aligning elements being of a construction sufficient for urging the hood toward a preselected position in response to passing the centering element into the opening and contacting the stop element with the aligning element during movement of the hood from the first to the second position.

3,981,376

VEHICLE PROTECTION MEANS

Albert E. Kluge, Jr., Bloomingdale, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 22, 1975, Ser. No. 615,261
Int. Cl.² B60K *17/22*
U.S. Cl. 180—70 P **6 Claims**



1. A vehicle, comprising:

a power means;

a transmission housing;

a power train positioned in the housing;

a drive shaft connected to the power train, said drive shaft having a "U" joint positioned adjacent and beneath a portion of the transmission housing; and

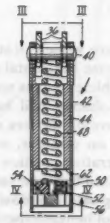
an impact barrier element positioned between the "U" joint and the overlaying transmission housing, said element having first and second flanges connected to the transmission housing and a middle portion connecting said flanges and being spaced a preselected distance from the transmission housing.

3,981,377

EXHAUST MUFFLER FOR PNEUMATIC TOOL OR MACHINE

Paul Gilberto, Milford, Conn., assignor to USM Corporation, Boston, Mass.

Filed Sept. 23, 1975, Ser. No. 615,907
Int. Cl.² F01N *1/20*
U.S. Cl. 181—36 A **5 Claims**



1. An exhaust muffler for a pneumatically actuated device having a pressure chamber and an exhaust passageway for relieving gas pressure in said chamber, the muffler comprising:

an exhaust conduit communicating with said passageway for exhausting said gas pressure from said chamber therethrough;

valve means interposed between said passageway and said conduit having a first state permitting relatively free flow of gas pressure through said conduit and a second state permitting relatively restricted flow of gas pressure through said conduit; and

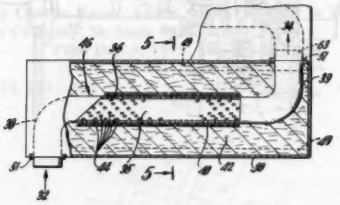
means biasing said valve means for maintaining said valve means in said first state when a relatively low gas pressure is present in said chamber, said biasing means yielding to relatively high gas pressure in said chamber for permitting said valve means to assume said second state.

3,981,378

MUFFLER FOR PILE DRIVING APPARATUS

Stannard M. Potter, Glastonbury, Conn., assignor to Horn Construction Co., Inc., Merrick, N.Y.

Filed Oct. 16, 1974, Ser. No. 515,226
Int. Cl.² F01N 1/10, 1/24
U.S. Cl. 181—50 20 Claims



1. A muffler for attenuating exhaust noise from a pile driving apparatus, which comprises a first muffler section comprising:

a housing having two ends;

a first inlet port formed in a side of said housing substantially near a first end thereof;

a first outlet port formed in a side of said housing substantially near a second end thereof;

an elongated muffler passage in said housing, having a perforated substantially straight portion, said straight section extending substantially from said first end of said housing to said second end of said housing;

an unperforated inlet end piece adapted to connect a first end of said straight section to said first inlet and an unperforated outlet end piece adapted to connect a second end of said straight section to the first outlet, said first and second end pieces being elbow pipe joints;

acoustical absorbing material in said housing surrounding said perforated straight section and filling said housing; and

screen means between said perforated straight section and said acousticai absorbing material, surrounding and in contact with said perforated straight section, said screen means being proportioned to permit access of acoustical waves from said exhaust gas noise to said acoustical absorbing material and to substantially prevent access of the exhaust gas and its contaminants to said acoustical absorbing material;

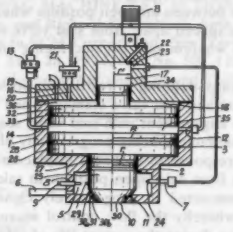
said first inlet port being adapted for connection to a source of exhaust gas such that said exhaust gas travels through said muffler passage wherein noise associated with said exhaust gas is substantially attenuated.

3,981,379

DEVICE FOR EMITTING MECHANICAL WAVES

Léon Sayous, Pau, France, assignor to Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

Filed May 30, 1975, Ser. No. 582,241
Claims priority, application France, May 31, 1974, 74.18911
Int. Cl.² G01V 1/06, 1/14
U.S. Cl. 181—118 10 Claims



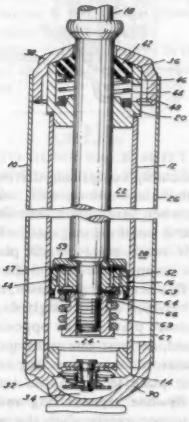
1. In a device for emitting mechanical waves comprising a pneumatic chamber for holding a high-pressure fluid, a valve member, and an element having a seat cooperating with said valve member, said element and valve member being coaxial and defining a combustion chamber adjacent said pneumatic chamber and adapted to be opened and closed by axial movement of said valve member, said combustion chamber being equipped with means for admitting fuel and oxidant and with ignition means, the improvement according to which said valve member is a differential piston having a first side which defines a mobile wall of the pneumatic chamber and an opposite side which defines a mobile wall of said combustion chamber.

3,981,380

SHOCK ABSORBER FOR MOTOR VEHICLE

Lee R. Andre, Tecumseh, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 12, 1975, Ser. No. 631,251
Int. Cl.² F16F 9/48
U.S. Cl. 188—282 6 Claims



1. A hydraulic shock absorber constructed to become stiffer during usage having first and second fluid chambers and flow control means constructed to provide a restricted fluid pas-

sage for the controlled flow of hydraulic fluid from said first chamber to said second chamber;

said flow control means including a fluid passage, a valve seat positioned about one end of said passage and a valve element;

said valve element having a metallic backing portion and an organic facing;

spring means exerting a spring force urging said organic facing into engagement with said valve seat;

said valve element being displaceable in response to fluid pressure between an open position wherein said organic facing is spaced apart from said valve seat and a closed position wherein said organic facing engages said valve seat;

orifice means defining a restrictive orifice between said valve seat and said valve element when said organic facing is in engagement with said valve seat;

said organic facings being progressively plastically deformable in response to repeated displacement of said valve element from said open position to said closed position and constructed to progressively close said restrictive orifice whereby the flow control means becomes more restrictive during the service life of said shock absorber.

3,981,381

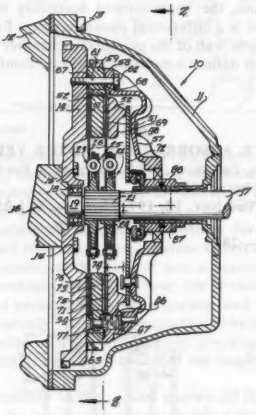
SELF-CONTAINED MULTIPLATE WET CLUTCH

Thaddeus W. Nosek, Roseville, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 10, 1975, Ser. No. 557,144

Int. Cl.² F16D *13/56, 13/74*

U.S. Cl. 192—70.18 **18 Claims**



1. A clutch assembly comprising driving and driven members rotatable about a common axis, said members having relative rotation when said clutch assembly is disengaged or when said clutch is not fully engaged, one of said members including two or more plates, each plate having friction clutching surface means thereon, and the other of said members including a flywheel, a clutch cover, and a unitary spacer ring interposed between and sealingly engaging the flywheel and cover, a pressure plate on the opposite side of the plates from said flywheel, at least one intermediate pressure plate between said plates, means connecting said spacer ring with said intermediate plate to cause the intermediate plate to rotate with the flywheel, spacer ring and clutch cover, and piloting means to accurately align the spacer ring and the clutch cover with the flywheel, comprising a circular pilot on one side of the spacer ring and a recess on the opposite side thereof, said flywheel having a recess in its interior face conformably receiving said spacer ring pilot, and said clutch cover having a flange facing the spacer ring with a pilot formed thereon conformably received in said spacer ring recess.

3,981,382

SAFETY CLUTCH DEVICE

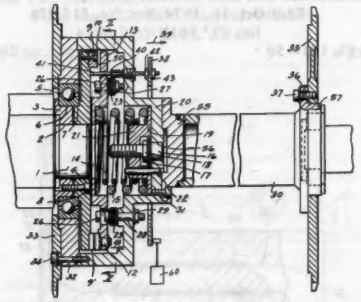
Edwin Bolliger, Morges, Switzerland, assignor to J. Bobst & Fils S.A., Switzerland

Filed May 21, 1975, Ser. No. 579,610

Claims priority, application Switzerland, May 28, 1974, 7299/74

Int. Cl.² F16D *7/04, 43/20*

U.S. Cl. 192—150 **10 Claims**



1. A safety coupling for transmitting torque between a pair of axially aligned shafts such as from a drive shaft to a driven shaft of a press, comprising a disk member having at least one slanting plane surface; a flange member having a slanting plane surface for each of the slanting plane surfaces of the disk member and extending substantially parallel thereto; first means for connecting the disk member for rotation with one of said pair of shafts; and second means for connecting the flange member for rotation with the other of said pair of shafts and in axial alignment with the disk member; said second means including means for enabling axial movement of the flange member from a first position with the slanting surfaces in torque transmitting engagement to a second position with the slanting surfaces withdrawn from engagement and biasing means for applying a force to urge the flange member to the first position, said means for enabling axial movement including a plurality of flexible link elements, said biasing means being adjustable to vary the force applied to the flange member so that the engaged slanting plane surfaces transfer torque between the pair of shafts until the amount of torque overcomes the force applied by the biasing means.

3,981,383

RIGHT HAND MARGIN CONTROL SYSTEM

John R. Bittner, Waynesboro, and Ronald D. Wesner, Crozet, both of Va., assignors to General Electric Company, Waynesboro, Va.

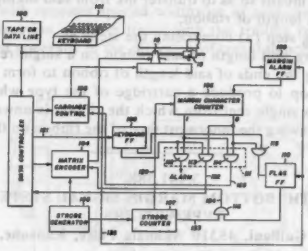
Filed Aug. 1, 1974, Ser. No. 493,973

Int. Cl.² B41J *21/02*

U.S. Cl. 197—63 **9 Claims**

1. A margin control system in combination will a recorder having a recording assembly that moves across a record medium and records characters in respective column positions in response to discrete character signals available from a source, comprising: switch means settable for actuation by said recording assembly at any selected column position thereof; and

indicator means operative in response to said recording assembly transversing a predetermined number of said column



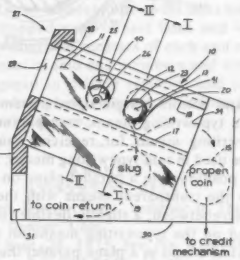
positions following actuation of said switch means to control recording of a special symbol in a succeeding column position.

3,981,384

COIN SIZE TESTER

Henry Charles Kovar, Anoka, Minn., assignor to The Cornelius Company, St. Louis Park, Minn.

Filed Dec. 5, 1975, Ser. No. 638,026
Int. Cl.² G07F *3/02*
U.S. Cl. 194—102 **49 Claims**



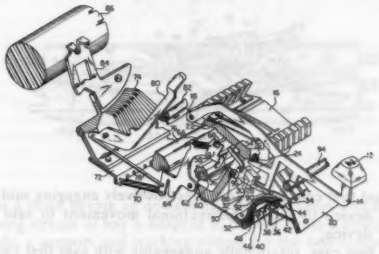
1. A coin size tester comprising:
a. an elongate coin trackway defined by and having
1. a bottom surface upon which a coin may roll;
2. a guide extending upward of a first side of the bottom surface for maintaining a coin upright on edge upon the bottom surface;
3. a retainer edge spaced upward from and positioned parallel to a second side of the bottom surface; and
4. a sizing edge positioned parallel to and spaced upward a predetermined distance from the bottom surface for maintaining only a coin of at least a predetermined diameter upright on edge upon the bottom surface;
b. a journal for containing a ball and having
1. a support at one end for positioning of a ball partially within the trackway;
2. an elongate ramp extending laterally from the trackway and upward from the support to the outside of the trackway on the guide side; and
3. a keeper at the upper end of the ramp for containing of a ball within the journal; and
c. a ball contained within the journal and having
1. a normal position resting against the support and projecting at least partially into the trackway from the guide side for biasing a coin against the retainer and sizer edges and obstructing free passage of a coin through the trackway;
2. an alternate position retracted into the journal for opening the trackway for passage of a coin; and
3. free movement upon the ramp between the normal and alternate positions, the ball being movable to the alternate position by a coin of at least the predetermined diameter passing through the trackway and returnalbe to the normal position after passage of such coin.

3,981,385

TYPING MACHINE KEY ACTION

Hans W. Mueller, and Richard E. Shattuck, both of Cortland, N.Y., assignors to SCM Corporation, New York, N.Y.

Filed Aug. 28, 1974, Ser. No. 501,122
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² B41J *23/06*
U.S. Cl. 197—17 **12 Claims**



1. In a typing machine of the kind having means for actuating a typing machine operation, a power roll rotatably mounted in the typing machine for engagement by the actuating means to actuate the typing machine operation, a key lever movably mounted in the typing machine, an interposer, means for supporting the interposer, means for releasing the interposer relative to the supporting means upon depression of the key lever, and means for restoring the key lever to a rest position, in combination, the improvement comprising:
a. means, connected between the interposer and a stationary portion of the typing machine, for biasing the interposer against the supporting means and after activation of the releasing means, against the actuating means to cause the actuating means to engage the power roll to actuate the typing machine operation; and
b. means for restoring potential energy in the biasing means during return of the key lever to the rest position by the restoring means.

3,981,386

NON RETURN TO HOME RACK SHIFT SELECTION MECHANISM FOR A SINGLE ELEMENT PRINTER

William A. Abell, Jr.; Thomas R. Field; Ralph A. Haus, and Iraj D. Shakib, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,391
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.² B41J *23/04*
U.S. Cl. 197—18 **1 Claim**

1. A printer having a type element mounted for rotation to present different characters to a print position, a pinion connected to said type element for rotation therewith, a drive device comprising a pair of rack members alternately positionable to engage diametrically opposite portions of said pinion, and means for driving an engaged rack member a measured distance wherein the improvement comprises:
a rack selection mechanism for shifting said rack members into and out of engagement, said rack selection mecha-

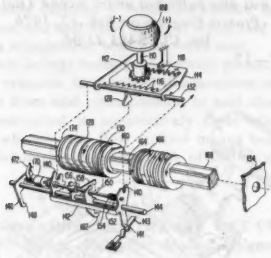
nism comprising a pivot member spacially fixed with respect to said printhead;

a first cam follower means pivotally mounted on said pivot member;

a second cam follower pivotally supported on said pivot member;

a third cam follower pivotally supported on said pivot member;

said first cam follower means supporting for monoaxial displacement relative thereto, a selectably displaceable member for coupling said first cam follower means alternatively with said second and said third cam followers;



said first cam follower means positively engaging said drive device to impart bidirectional movement to said drive device;

a first cam, rotationally engageable with said first cam follower;

second cam rotationally engageable with said second cam follower, said first and second cam followers spacially displaced such that said first and second followers can not be simultaneously engaged by the respective first and second cams;

third cam engageable with said third cam follower to shift said first cam follower about said pivot member when said displaceable member is engaged with said third follower, said cams being axially movable into and out of engagement with said respective followers.

3,981,387

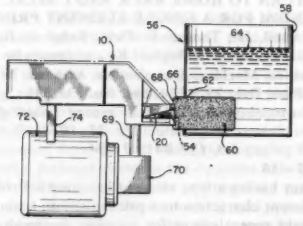
METHOD FOR INKING PREASSEMBLED RIBBON CARTRIDGES

James A. Gottschlich, Bellbrook, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 24, 1974, Ser. No. 536,133

Int. Cl.² B41J *33/10*

U.S. Cl. 197—168 **14 Claims**



1. A method of producing an inked ribbon cartridge comprising the steps of:

a. loading a length of uninked ribbon into a ribbon cartridge having a support area where a portion of the ribbon is supported and exposed;

b. positioning an inking means and the portion of the ribbon exposed at said support area is operative proximity with each other; and

c. driving said ribbon while in operative proximity with said inking means so as to transfer ink from said inking means to said length of ribbon;

said loading step (a) comprising the steps of:

d. winding said length of said ribbon on a single reel; and

e. jolning the ends of said length of ribbon to form an endless loop to produce a cartridge of the type which employs a single reel from which the ribbon is unwound by withdrawing the innermost turn of the ribbon on the reel.

3,981,388

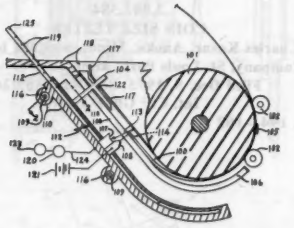
AUTOMATIC BOTTOM MARGIN SIGNAL SYSTEM FOR TYPEWRITERS

Robert L. Guiliani, 45310 Akimala Place, Kaneohe, Hawaii 96744

Filed Nov. 20, 1974, Ser. No. 525,593

Int. Cl.² B41J *29/44*

U.S. Cl. 197—189 **3 Claims**



1. Automatic bottom margin signal system for typewriters comprising: a typewriting means; transparent means located on the typewriting means for receiving material in sheets adopted to be used in said typewriting means; a light reflective plate means positioned in a parallel plane on one side of and spaced from the transparent means with the sheet material receivable therebetween; a slightly flexible rod means adjustably mounted on the typewriting means on the otherside of said transparent means in a plane parallel thereto and spaced therefrom; a light source mounted on the rod means; a light responsive means mounted on the rod means in juxtaposition with the light source, whereby light from the source will shine through the transparent means to the reflective plate means and reflect back to the light responsive means; alarm means, and electrical circuit means connected between the light responsive means and alarm means whereby light from the light source being unobstructed by the sheet material and reflected from the reflective plate reaching the light responsive means will cause the alarm to be activated.

3,981,389

TANDEM BOTTLE CARRIER ASSEMBLY

Momir Babunovic, Des Peres, and John C. Kay, Spanish Lake, both of Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo.

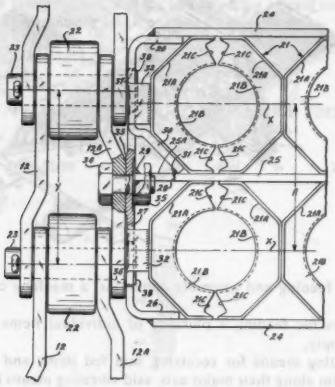
Filed Dec. 20, 1974, Ser. No. 534,759

Int. Cl.² B65G *17/00*

U.S. Cl. 198—655 **3 Claims**

1. In a tandem bottle carrier assembly for bottle washers the improvement which comprises a pair of roller chains in spaced parallel relation, said chains including a series of rollers, a series of links interconnecting said rollers at least on one side of the rollers, said links having overlapped ends; pin means extending through each of said rollers and engaged in said overlapped ends of adjacent ones of said links, said pins having heads thereon in opposed facing relation between said pair

of chains; elongated carrier means extending between said pair of roller chains, each of said carrier means including two series of bottle receiving pockets spaced widthwise of said carrier means in tandem formation, and an end member on the opposite ends of the said carrier, said end members being formed with recesses spaced widthwise of said carrier means in the direction of chain travel with the trailing recess being elongated generally in the direction of travel to accommodate



chain stretch; means securing each end member to the adjacent roller chain at an adjacent one of the links between a pair of adjacent overlapped ends of said links and with said pin heads disposed within said recesses of each end member; and the leading recesses of said end members and one of said pin heads being engaged in driving relation, said pins and end member recesses being spaced apart a distance less than the width of said carrier means.

3,981,390

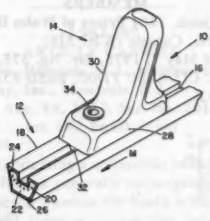
CONVEYING BELT

Byron G. Richard, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Sept. 25, 1975, Ser. No. 616,740

Int. Cl.² B65G *15/42*

U.S. Cl. 198—844 **7 Claims**



1. Conveying apparatus comprising:

a belt having a substantially flat top surface with at least one groove therein oriented longitudinally of the belt and generally perpendicular to a transverse horizontal axis of the belt; and extending from said substantially flat top surface to a position below said substantially flat top surface.

at least one working element with a foot portion with at least one rib and a leading portion, the foot portion disposed against the top of the belt with the rib disposed in the groove;

a fastener extending through a portion of the belt and only the leading portion of the foot portion in a direction generally normal to the groove;

whereby the fastener, rib, and groove in the belt substantially (1) preclude the foot portion from pivoting at the top surface of the belt; and (2) do not inhibit belt bending.

3,981,391

BELT TRACKING SYSTEM FOR A BALER

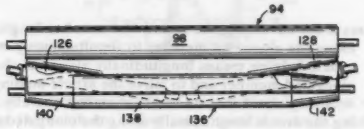
Carmen S. Phillips, and Charles D. Mecklin, both of Memphis, Tenn., assignors to International Harvester Company, Chicago, Ill.

Filed Aug. 21, 1974, Ser. No. 499,352

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² B65G *15/62*

U.S. Cl. 198—308 **9 Claims**



1. In a baler having an endless drivable belt upon which an incoming stream of hay is adapted to be rolled into a cylindrical bale, a support and tracking system for the belt comprising:

a generally horizontal frame extending fore-and-aft of the baler;

a power-drivable roller journaled on a forward portion of said frame;

a tightener roller journaled on a rearward portion of said frame, said belt being trained about said rollers so as to be disposed therebetween in upper and lower runs, said drivable roller being adapted to move said lower run in a forward direction;

a pair of guiding rollers journaled on said frame in a V-configuration relative to each other as viewed in transverse vertical section and in horizontal plan to engage and support said lower run in a transverse trough-like configuration, thereby maintaining said belt in centered relation on said driving and tightening rollers;

a compensating roller journaled on said frame in engagement with said lower run between said guiding rollers and said drivable roller, said compensating roller having a cylindrical central portion and outwardly tapered end portions for engaging the troughed lower run as received from said guiding rollers to dispose the lower run uniformly into contact with said drivable roller.

3,981,392

APPARATUS FOR CONVEYING ARTICLES TO FORM LAYERS OF FUSIBLE METAL THEREON

David L. Booz, Allentown; Ford J. Brown, Kutztown, and Richard J. Merwarth, Easton, all of Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 291,482, Sept. 22, 1972, Pat. No. 3,882,816. This application Mar. 21, 1975, Ser. No. 560,450

Int. Cl.² B65G *47/24*

U.S. Cl. 198—377 **7 Claims**

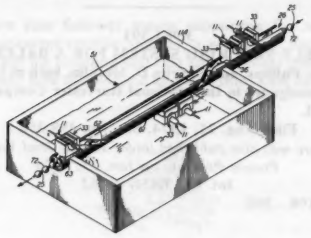
1. An apparatus for conveying articles, which comprises:

an elongated member having a surface and a slot formed in the surface and curving helically about the axis of the elongated member;

a strand-like member extending along the elongated member;

means for holding the articles;

means passing through the slot, including grooved portions supported by and slidably engaging the edges of such slot, for movably mounting the article holding means to the strand-like member to enable said article holding means to move rotatably about said strand-like member; and



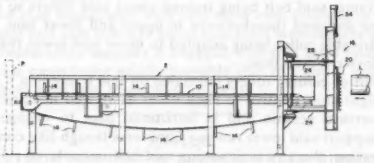
means for advancing the strand-like member longitudinally along the elongated member to simultaneously move the article holding means longitudinally along the slot of the elongated member and to move the article holding means rotatably about the strand-like member, thereby conveying the article longitudinally along the elongated member and simultaneously moving them rotatably about the strand-like member.

3,981,393

LOG TURNING APPARATUS

Adrian L. Landers, Emmett, Idaho, assignor to Adco-West Machinery Manufacturing Company, Emmett, Idaho

Filed Oct. 8, 1974, Ser. No. 513,053
Int. Cl.² B65G *47/24*
U.S. Cl. 198—379 **5 Claims**



1. Apparatus for rotating an axially traveling horizontal log about its longitudinal axis, comprising

a. frame means for supporting the log for axial travel along a given path, said frame means including conveyor means (**10**) for axially conveying the log along said path;

b. a pair of support arms (**22, 24; 122, 124**) pivotally connected with said frame means on opposite sides of the vertical plane containing the path of axial travel of the log;

c. a pair of cylindrical rollers (**18, 20; 118, 120**) freely rotatably connected in parallel relation with said support arms, respectively, on opposite sides of the path of travel of the log, each of said rollers also being connected for axial vertical displacement relative to its associated support arm;

d. first motor means (**28, 128**) connected at each end between said support arms for pivoting said support arms toward and away from operating positions in which the rollers are vertical, parallel and in frictional engagement with diametrically opposed portions of the log; and

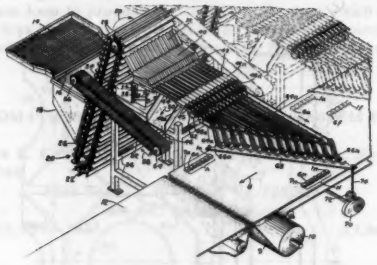
e. second motor means (**32, 34; 132, 134**) for axially displacing said rollers in opposite directions relative to their respective support arms when said rollers are in frictional engagement with the log, thereby to rotate the log about its longitudinal axis relative to said frame means.

3,981,394

FEEDING AND ASSEMBLY APPARATUS

Donald A. Slathar, Chanhassen, and Christiaan H. Neutkens, Cottage Grove, both of Minn., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed June 3, 1975, Ser. No. 583,390
Int. Cl.² B65G *47/14*
U.S. Cl. 198—391 **7 Claims**



1. In feeding and assembly apparatus, a machine comprising:

means for feeding a plurality of individual items from a supply;

vibrating means for receiving said fed items and moving them along their major axis, said vibrating means includes a row of vibrating members, each of said members are V-grooved and have a narrow middle section for providing a space between adjacent members, whereby all items which are unaligned lengthwise along the V-groove drop through the spaces provided between adjacent members;

means coupled to said vibrating means for engaging said items and depositing them in a row across a conveying means moving transversely to said vibrating means, said means for engaging and depositing include a row of wheels terminating said vibrating means for engaging said items, a chain lug bed for receiving said items from said wheels and depositing them onto a slide chute, and a reciprocating means for positioning the items from the slide chute in said row across the conveying means; and

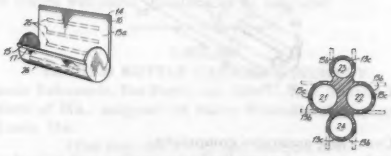
means for returning the dropped items to said supply.

3,981,395

CONTAINER FOR COINS AND SIMILAR DISC SHAPED MEMBERS

Jack Frank Dalgleish, 1401 Prince of Wales Drive, Apt. 1505, Ottawa, Ontario, Canada (K2C 3J8)

Filed May 7, 1975, Ser. No. 575,164
Int. Cl.² A45C *11/00*; B65D *85/58*
U.S. Cl. 206—.82 **4 Claims**



1. A container for coins, comprising an integral single piece molded structure having two circular spaced apart end members and a wall joining said end members, said wall extending peripherally for the entire periphery of said end members and integral with said end members for a maximum of half of the periphery of said end members to form a fixed portion integral with said end members and a flexible flap portion, said wall in a closed condition of the container having opposed laterally extending edges, a first integrally molded formation extending

along one of said edges and a second integrally molded formation extending along the other of said edges, said first formation including a re-entrant portion extending laterally for the length of said one edge on an outer surface of said wall, said second formation including a projection extending inwardly from said other edge for the length of the wall, said other edge on said flap, said projection adapted to enter into said re-entrant portion with said formations in overlapping relationship, whereby when the container is closed and said formations are interengaged, flexing and stressing of said container urges said formations into continued engagement.

3,981,396

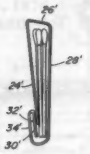
SAFETY MATCHBOOK

Peter W. Frangos, 39 Salem Ave., Cranston, R.I. 02920

Filed May 8, 1975, Ser. No. 575,494

Int. Cl.² A24F *27/12, 27/00*

U.S. Cl. 206—109 **1 Claim**



1. A safety matchbook, comprising

a. a plurality of matches connected to one another along a common base,

b. a cover attached to said matches to form a book,

c. said cover including a front flap, a back wall integral with said flap and attached to said base to form a book,

d. a lip connected to said back wall and to said base,

e. a wall forming a substantially flat tube open from end-to-end connected to one side of said cover at the base thereof, said tube being integral with said cover and extending transversely thereof for the full width thereof, and,

f. a stratum of abrasive material disposed in a continuous strip along the inner face of said tube for the full length thereof, and a stratum of aluminum foil disposed in a continuous strip along the inner face of said tube opposite to and coextensive with said abrasive stratum.

3,981,397

ARTICLE CARRIER

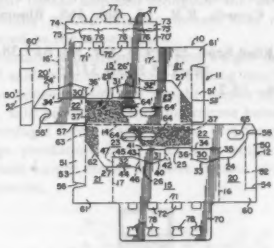
Edwin L. Arneson, Hillsdale, N.J., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Filed Aug. 18, 1972, Ser. No. 281,999

Int. Cl.² B65D *75/00*

U.S. Cl. 206—178 **5 Claims**

1. A blank for fabricating a collapsible cellular bottle carrier which is formed from a generally rectangular sheet of paperboard or like material wherein the blank is divided by a longitudinal center fold forming crease line into two generally rectangular sections which sections are offset relative to each other in the longitudinal direction of the blank and wherein each of said blank sections is divided by cut and crease lines extending transversely relative to said center crease line into a side wall forming panel, end wall forming panels at the opposite ends of said side wall forming panel and a combination handle and partition forming panel extending along said center fold forming crease line, each of said end wall forming panels having a free marginal portion extending transversely relative to said center crease line, a relatively narrow riser panel cut in each said free transverse marginal portion which is separated therefrom by a hinge forming crease line extending transversely of said center crease line, each riser panel terminating short of the outer longitudinal side edge of the blank section so as to leave an integral portion of the associated end wall forming panel extending in the plane thereof and longitudinally beyond the crease line separating the riser panel therefrom, each said handle and partition forming panel being separated from the associated side and end wall forming panels by transversely spaced, longitudinally extending cutting lines, and transverse hinge forming longitudinally spaced



crease lines extending between said cutting lines and cooperating therewith to define cross partition straps, and a hinge forming transverse crease line dividing each said handle and partition forming panel into a handle panel portion and a handle reinforcing panel portion with the handle reinforcing panel portions being taken from material at opposite ends in the longitudinal direction of said handle portions and from longitudinally opposite ends of said blank.

3,981,398

AID IN THE MANAGEMENT OF CLINICAL EMERGENCIES IN MEDICAL AND DENTAL PRACTICES AND OTHER CIRCUMSTANCES

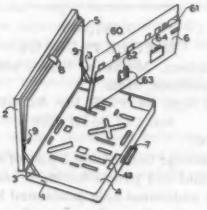
Pieter Nico Sinclair Boshoff, Pretoria, South Africa, assignor to Hendrik Lukas Pienaar, Verwoerdburg, South Africa

Filed Jan. 29, 1975, Ser. No. 545,190

Claims priority, application South Africa, Sept. 13, 1974, 74/5849

Int. Cl.² B65D *69/60;* **G09B** *23/28*

U.S. Cl. 206—223 **9 Claims**



1. An emergency kit comprising means for administering emergency clinical treatment to animals or persons, said means comprising a plurality of articles, said articles comprising drugs and medical instruments, a holder for said articles, a plurality of masks, said holder being adapted to hold each particular article in one particular position in combination with said plurality of different masks, the masks being located in said kit in a manner adapted to permit selection of any one mask from the plurality of masks, the masks being adapted for any such selected mask to be placed one only at a time in one particular masking position to mask some but not all articles in the holder, each mask having openings which are adapted to expose some other articles in the holder, the exposed articles being clinically appropriate to one particular mode of

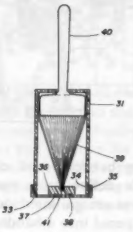
clinical treatment of animals or persons, each mask being identifiable by suitable markings as being appropriate to the particular mode of clinical treatment for which the articles which that mask is adapted to expose in the masking position are appropriate, each particular mode of clinical treatment associated with each mask being appropriate to a definable clinical condition.

3,981,399

APPARATUS FOR HOLDING A PAINT BRUSH

William R. Crouch, R.R. 13, Box 468, Bloomington, Ind. 47401

Filed Sept. 22, 1975, Ser. No. 615,384
Int. Cl.² B65D *51/26*
U.S. Cl. 206—15.2 **1 Claim**



1. A paint brush keeper comprising:

a box assembly with a movable wall to allow insertion of a paint brush into the box assembly, said box assembly including a bottom and a top wall, said top wall having a hole through which the handle of the paint brush projects;

said box assembly including a pair of diverging walls extending from said bottom to said top wall, said walls sized to receive and form the bristled end of a paint brush into a tapered configuration; and wherein:

said pair of walls form an insert mounted within said box assembly;

said box assembly includes a box with an open bottom and box configured cap fittable on said open bottom closing said box assembly;

said cap includes an interior block with a V-shaped groove fittingly receiving and locating said insert.

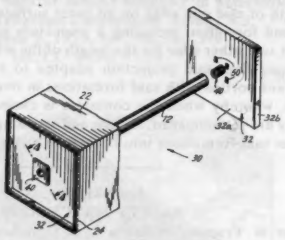
3,981,400

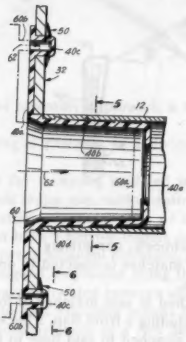
TEXTILE PACKAGE

Michael A. Quintana, Methuen, Mass., assignor to Malden Mills, Inc., Lawrence, Mass.

Filed Sept. 30, 1975, Ser. No. 617,995
Int. Cl.² B65D *85/67*
U.S. Cl. 206—407 **4 Claims**

1. A textile package comprising a pair of end panels having edges; each of said end panels having a central hole therein and at least one additional hole positioned between said central hole and an edge thereof; a pair of connector elements each including a flat flange, a central sleeve projecting from the inner face of said flange and at least one lug projecting from said inner face in the direction of said sleeve, each said sleeve being inserted in the central hole of an end panel with said at least one lug passing through said at least one additional hole in each end panel; at least one locking means on said at least one lug on each connector element securing the connector element to each end panel; a hollow connecting tube positioned between said connector elements with the sleeves being received in the hollow ends thereof; the sleeve on each connector element being tapered with the diameter of its end furthest away from the flange being smaller than the inner diameter of said tube and having a plurality of sharp-cornered circumferential ridges, the outer diameter of at least one circumferential ridge near the flange being larger than the inner diameter of said tube so that a force-fit is achieved by said at least one circumferential ridge deforming the tube slightly and opposing the withdrawal of the sleeve from the





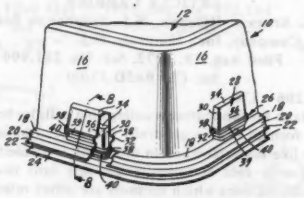
tube; and a wrapper extending from one end panel to the other and being secured to the edges of both end panels.

3,981,401

COVER FOR PLATES AND STACKING DEVICES THEREFOR

Richard Lewis Blanchard, St. Charles, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Mar. 14, 1975, Ser. No. 558,460
Int. Cl.² B65D *21/02*
U.S. Cl. 206—508 **6 Claims**



1. An integrally formed, nestably stackable thin-walled flexible cover having a topwall, a side wall extending downwardly therefrom and a peripherally continuous flange member extending outwardly to an open end, said sidewall being formed with a plurality of outwardly deformed stacking devices disposed in selected circumferential spaced relation to provide predetermined axial spacing and positive alignment of a plurality of said covers when stacked, each of said stacking devices comprising:

1. a stack stabilizer having a top portion horizontally disposed and extending outwardly from the sidewall, a face portion vertically depending from the top portion and,

2. a stack shoulder having a first horizontally disposed portion depending from the face portion of said stabilizer and extending outwardly from the sidewall to define a stacking ledge, and a reverse tapered member, depending from said stacking ledge and extending inwardly and downwardly to merge with the flange member at the open end of the cover;

the top and face portions of the stack stabilizer, the stacking ledge and the reverse tapered member of the stack shoulder each having returned sides which extend inwardly to merge with the sidewall of the cover;

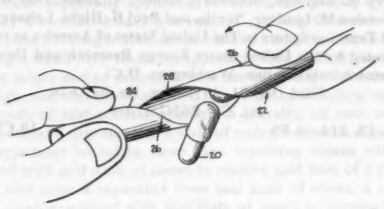
said stacking devices providing minimal clearance between sidewalls of nested covers at sections of controlled overlap and maintaining contact therebetween during horizontal shift.

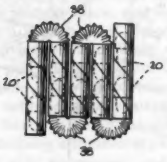
3,981,402

PELLET DISPENSER

Neil W. Miller, New Britain, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 26, 1974, Ser. No. 446,065
Int. Cl.² B65D *3/04*; A47F *11/16*
U.S. Cl. 206—534.2 **7 Claims**





1. A pellet container comprising an elongated tubular element having a helical slit extending nearly to each end of the tubular element, the tubular element formed of a strip of stiff but resilient plastic material, containing a plurality of pellet-like elements in aligned array with the inner surface of the container frictionally gripping the elements, the resiliency of the material being sufficient normally to maintain the strip in its closed tubular configuration wherein and adjacent edges of the helical slit are in contact, and to yield to manual twisting forces applied thereto for opening the strip in selected locations for dispensing at least one of its pellet-like elements.

3,981,403

OSCILLATING FREE SWINGING SIFTER APPARATUS

Otto J. Zimmerman, Oklahoma City, and Walton L. Mock, Bethany, both of Okla., assignors to Smico Corporation, Oklahoma City, Okla.

Filed Oct. 2, 1974, Ser. No. 511,387
Int. Cl.² B07B *1/44*
U.S. Cl. 209—366.5 **22 Claims**

1. A free swinging sifter apparatus comprising:

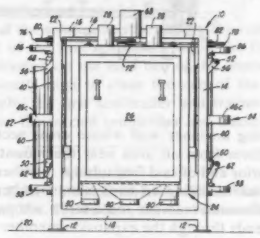
sieve means for classifying materials passed through the sieve means during movement thereof;

elongated flexible suspension means connected to said sieve means for vertically suspending the sieve means for free-swinging movement;

an upright suspension framework supporting said flexible suspension means and spaced from said sieve means to avoid contact by said sieve means with said suspension framework during free swinging movement of said sieve means;

first weight means disposed alongside the sieve means in horizontally spaced relation thereto and mechanically connected to the sieve means;

means pivotally supporting said first weight means from a side of said sieve means and affording mechanical connection between said first weight means and said sieve means, said pivotally supporting means being responsive to centrifugal force acting on said first weight means to undergo pivotation along with said weight means and allow said weight means to move further away from said sieve means;



second weight means spaced from the first weight means and spaced horizontally from said seive means alongside said sieve means and mechanically connected to the sieve means, said second weight means being disposed on the opposite side of said sieve means from said first weight means;

means pivotally supporting said second weight means from a side of said sieve means and affording mechanical connection between said second weight means and said sieve means, said means pivotally supporting said second weight means being responsive to centrifugal force acting on said second weight means during swinging movement of said sieve means to pivot outwardly with said second weight means as said second weight means is displaced further from said sieve means;

a prime mover mounted directly on said sieve means at a location between, and spaced from, said first and second weight means; and

flexible drive means connected between the prime mover and each of said first and second weight means to drive each of said first and second weight means in rotation.

3,981,404

TELESCOPING GARMENT HANGER

John C. Goeke, 161 SW. 18th St., Richmond, Ind. 47374

Filed Jan. 20, 1975, Ser. No. 542,234
Int. Cl.² A47H *1/08*
U.S. Cl. 211—1.3 **1 Claim**

1. A telescoping garment hanger comprising:

a. a first tubular member having an exterior end and an interior end;

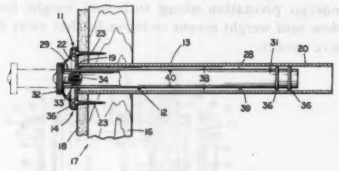
b. a second member having an exterior end and an interior end, said second member being telescopically received by said first tubular member;

c. mounting means near the exterior end of said first tubular member for mounting said first tubular member in a structure;

d. alignment means on said second member near the interior end of said second member for preventing said second member from disengaging from said first tubular member and for preventing angular displacement of the axis of said second member relative to the axis of said first tubular member when said second member has been extended from said first tubular member;

e. stop means near the exterior end of said second member for preventing objects hanging on said second member from sliding off said second member when it has been extended from within said first tubular member; and

f. attachment means for removably attaching the stop means to the second member, the perimeter of the cross section of the second member being essentially uniform from the location of the alignment means to the exterior end of the second member and the first tubular member



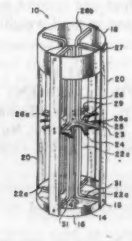
having an inner wall whose cross section is essentially uniform from an area near the mounting means to the interior end of said first tubular member, said attachment means including an expansion member mounted within said second member and a screw whose threaded portion extends through the expansion member and is threadedly received within the stop means, increasing the engagement of the screw within the stop means expanding the diameter of the expansion member thereby retaining the stop means near the exterior end of the second member, whereby adjustment of the overall length of the telescoping garment hanger may be made prior to installation by removing a portion of the interior end of the first tubular member and by removing a portion of the exterior end of the second member before attachment of the stop means to the second member.

3,981,405

ROTATABLE DISPLAY AND STORAGE STAND FOR FLOOR COVERINGS

John A. Slack, Dalton, Ga., assignor to World Carpets, Dalton, Ga.

Filed June 16, 1975, Ser. No. 586,856
Int. Cl.² A47F 7/18
U.S. Cl. 211—70 **5 Claims**



1. A display and storage rack for rolled samples of floor covering materials and the like, comprising:

a. a standard having foot portions for supporting a generally upright, vertical portion therefrom;

b. a rotative assembly comprising a first disc for supporting an end of each of the rolled sample to be displayed and a second disc spaced therefrom and having sets of recesses therein disposed about the periphery of said second disc, each said recess being of a configuration and size for receiving at least a single roll of the floor covering, and first plurality of bracket members for supporting said first and second disc in a spaced relationship, said first disc having an opening therethrough for receiving said standard, whereby said assembly is rotatively supported about said upright, vertical portion;

c. a second plurality of bracket members, each having a first leg portion fastened by fastening means to an upper surface of said second disc, a second leg portion and a connecting bite portion; and

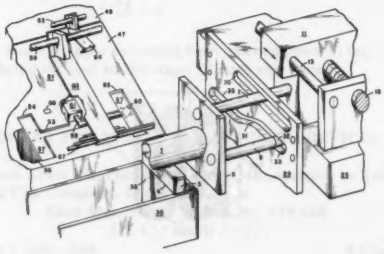
d. a lower cylindrical member and an upper cylindrical member respectively connected to said first leg portions of said first mentioned plurality of brackets and to said upper leg portion of said second plurality of brackets.

3,981,406

AUTOMATIC BOX LOADER

Harry H. Eldridge, Monterey; Robert A. Jones, Oak Ridge; Gordon M. Lindner, Norris, and Paul H. Hight, Lebanon, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 31, 1975, Ser. No. 627,624
Int. Cl.² B65G 57/04
U.S. Cl. 214—6 FS **10 Claims**



1. A tube-handling system comprising:

a tube-retainer having an inclined face for retention of a layer of tubes;

means for depositing on said face a plurality of ferromagnetic armatures;

means for loading said retainer with a layer of said tubes bridging said armatures, thus providing an assembly comprising a tube layer and armatures underlying the same;

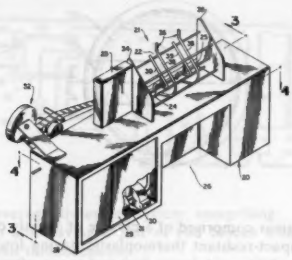
transport means for said assembly, said means including an elongated member carrying a row of electromagnets; and

drive means for alternately effecting (a) advance of said member toward said retainer to first station where said electromagnets are contiguous with said assembly and respectively in magnetic-coupling relation with the armatures thereof and (b) retraction of said member from said first station to a second station more remote from said retainer, said drive means including magnet-positioning means for angularly displacing said electromagnets toward said retainer in the course of said advance and away from said retainer in the course of said retraction.

3,981,407
CONE LABELING, SEPARATING AND RESTACKING APPARATUS AND METHOD

Robert G. Potts, 3007 Dodson Ave., Chattanooga, Tenn. 37406

Filed Aug. 15, 1974, Ser. No. 497,554
Int. Cl.² B65G 59/00; B65H 3/08
U.S. Cl. 214—8.5 E 3 Claims



1. Cone separating apparatus for cones comprising a frustum of a cone and having a conical opening therethrough, each cone defining a nose at the smaller end of said cone and having a small hole therethrough, each cone defining a base at the larger end of said cone and having a large hole therethrough, said small hole and said large hole constituting opposite ends of said conical opening, a plurality of said cones being stacked together into a stalk of cones, said cone separating apparatus including cone base receiving means axially aligned with said stalk of cones to receive said base of a cone after said cone is separated from said stalk of cones, a cone nose receiver aligned with said stalk of cones to receive said nose of a cone at the end of said stalk of cones, means for compressing said stalk of cones including means for moving said cone base receiving means towards said cone nose receiver for causing said stalk of cones to be nested tightly together, means for closing said small hole in two contiguous cones to define an annular space, said means for closing said small hole in two contiguous cones comprising a nozzle having a uniform outside diameter substantially equal to the diameter of said small hole and a length greater than the distance between said small hole in any two contiguous cones, a supply pipe, said nozzle defining an axial passageway therein, said axial passageway being in communication with said supply pipe, said nozzle defining a transverse passageway in communication with said axial passageway and positionable in said annular space for placing said annular space in communication with said supply pipe, a source of fluid under pressure for supplying fluid through said supply pipe to said passageways and for placing fluid under pressure within said annular space sufficient to cause the endmost cone of said stalk of cones to move towards said cone base receiving means, said cone base receiving means receiving the base of said endmost cone.

3,981,408
APPARATUS FOR TRANSPORTING ONE VEHICLE BY ANOTHER

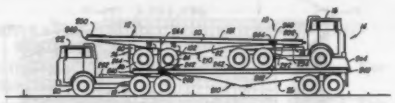
Finis Lavell Chisum, Rte. 5, Woodcrest Heights, Claremore, Okla. 74017

Continuation-in-part of Ser. No. 336,869, Feb. 28, 1973. This application Sept. 3, 1974, Ser. No. 502,610
The portion of the term of this patent subsequent to Oct. 15, 1991, has been disclaimed.
Int. Cl.² B60P 1/28
U.S. Cl. 214—506 11 Claims

1. In combination:

first and second semitrailers and tractors, each of the semitrailers including an elongated load bed having support wheels adjacent the rear end thereof, each tractor having an operator's cab and a fifth wheel for connection to the front end of the respective semitrailer, and each semitrailer and tractor having a wheel base defined by the distance between the forward and rear wheels;

lift means adjacent the forward end of said second semitrailer for lowering the forward end of the load bed of the second semitrailer substantially to the ground and for raising the load bed from said lowered position to a position sufficiently high to be coupled to the fifth wheel of the second tractor whereby the forward end of the second semitrailer can be lowered to form a ramp, and the first



semitrailer and tractor may be driven onto the load bed of the second semitrailer;

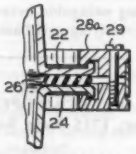
means for reducing the wheel base of the first semitrailer and tractor to a length no greater than the length of the load bed of the second vehicle; and

means on one of the semitrailers for raising the rear end of the load bed of the first semitrailer when the first semtrailer is positioned on the load bed of the second semitrailer sufficiently high to clear the cab of the second tractor whereby the first semitrailer and tractor can be transported on the second semitrailer and tractor.

3,981,409
COLLAPSIBLE REUSABLE BARREL FOR FLUIDS

Robert D. Flanders, Rte. 2, Box 666, No. 42, Wilsonville, Oreg. 97070

Continuation of Ser. No. 255,597, May 22, 1972, Pat. No. 3,940,008. This application Sept. 19, 1975, Ser. No. 614,863
Int. Cl.² B65D 7/02, 45/16; F16L 23/00
U.S. Cl. 220—5 R 1 Claim



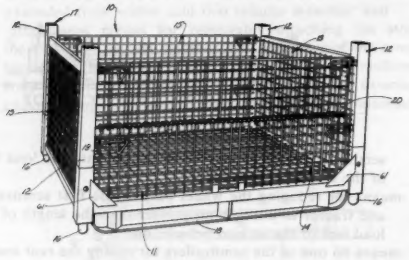
1. In a barrel for storing and shipping fluids and other materials comprised of a pair of frustrum-shaped shell-like barrel sections, each having a closed end and an open end larger than said closed end and being interchangeably nestable one within the other when disassembled, said barrel sections each having mating means for sealingly and detachably joining said open ends together with the respective interiors of said two barrel sections facing one another, the improvement wherein said mating means comprises: a pair of projecting flanges each extending peripherally around the respective open ends of said barrel sections, a resilient gasket for inserting between said flange pair, a plurality of unitary C-shaped clamp members spaced at arbitrary locations along the periphery of said flange pair for holding said flange pair in non-contacting close proximity with said gasket compressed therebetween, and means associated with said flange pair and said clamp members for interlockingly engaging said flange pair and clamp members at said arbitrary locations along the periphery of said flange pair while permitting said clamp members to be detached from said flange pair at said arbitrary peripheral locations by the pressing of said barrel sections together momentarily to increase the compression of said resilient gasket, thereby freeing said flange pair from engagement with said clamp members.

3,981,410

RIGID, COLLAPSIBLE AND NESTABLE CONTAINER

Richard Charles Schurch, Livonia, Mich., assignor to Armco Steel Corporation, Middletown, Ohio

Filed Dec. 19, 1975, Ser. No. 642,310
Int. Cl.² B65D 7/24; B65J 1/02
U.S. Cl. 220—6 10 Claims



1. A rigid collapsible container comprising:

a. a rectangularly shaped base member having upstanding corner posts at each of the corners thereof, said corner posts being pivotal about a point near said base member from a vertical position to a position overlying said base member and including male nesting means extending below said base member and female nesting means for mating with said male nesting means when said corner posts are in said vertical position and in said position overlying said base member;

b. a pair of side panels each extending between and pivotally associated with a pair of said corner posts; and

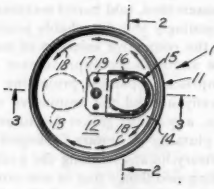
c. front and rear panels extending between said side panels and hingedly secured to said base member, said front and rear panels being swingable between a vertical position and a position overlying said base member.

3,981,411

SAFETY CAN OPENER

Robert A. Hofstetter, 1715 Rada Road, Hacienda Heights, Calif. 91745

Filed Jan. 26, 1976, Ser. No. 652,160
Int. Cl.² B65D 41/32
U.S. Cl. 220—267 5 Claims



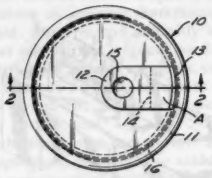
1. A safety can opener, comprising a liquid containing can, a pivotable tab secured to the top of said can in recessed means of the top, shearing edge means on said tab for shearing an opening in the top of said can, indentation and nipple means on said can, providing stop means for the alignment of said tab with a scored line, and means for retaining said tab within the opening that is defined by said scored lines.

3,981,412

CONTAINER CLOSURE

Richard W. Asmus, 3628 W. 48th St., Cleveland, Ohio 44102

Filed Mar. 29, 1971, Ser. No. 128,804
Int. Cl.² B65D 17/20
U.S. Cl. 220—270 9 Claims



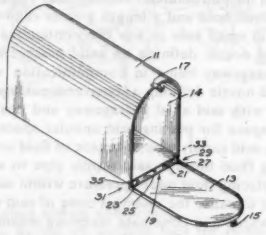
1. A container comprised of a closure of cleanly combustible, high impact-resistant thermoplastic having low gas and vapor permeability and lower tear-resistance after rupture, said closure being united to the rim of the mouth of a container body, an opening tab having a free portion and a portion fused to said closure, said closure having a rupture line of lesser section defining the periphery of an opening therein, and said tab being positioned with respect to said line whereby the forces of a pull on the free portion of said tab concentrate at a rupturable portion of said rupture line and the continuation of a pull sufficient to effect initial rupture will continue to tear said closure along said line and allow said container to be opened.

3,981,413

MAILBOX DOOR MOUNTING ARRANGEMENT

Alexander M. Cornwell, Jr., St. Louis, Mo., assignor to Jackes-Evans Manufacturing Company, St. Louis, Mo.

Filed Apr. 28, 1975, Ser. No. 568,482
Int. Cl.² B65D 43/14, 51/04
U.S. Cl. 220—334 10 Claims



1. A mounting arrangement for a mailbox door, the mailbox having an open end to be selectively closed by a door, comprising:

a rigid flat bar extending across the door adjacent the bottom thereof;

fastening means for securing said flat bar to the door to strengthen the door against distortion, said fastening means precluding relative movement between said flat bar and the door;

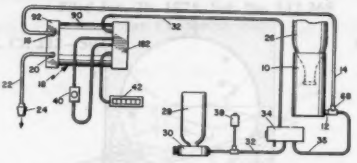
supporting members rigidly connected to said flat bar and extending generally transversely thereto at each end thereof; and

mounting means for pivotally connecting said supporting members to either side of the mailbox, the connection of said supporting members to the side of the mailbox and the use of said rigid flat bar stengthening the mailbox as well as the door against distortion.

3,981,414
BEVERAGE DISPENSING SYSTEM

Raymond Edward Gust, 10327 Strawberry Lane, Spring Valley, Calif. 92077, and Patrick Henry Murphy, 1464 Bridge Street, Clarkson, Wash. 99403

Filed Apr. 7, 1975, Ser. No. 565,435
Int. Cl.² B67D *5/22*; **G01F** *11/06*
U.S. Cl. 222—38 **9 Claims**

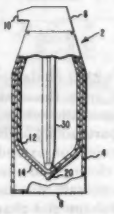


1. A beverage dispensing system, comprising:
a pump unit having a pair of end blocks with a cylinder secured therebetween;
a piston slidable in said cylinder between a retracted position and an extended position;
the first of said end blocks having a liquid inlet and liquid outlet therein, communicating with the interior of the cylinder;
the second of said end blocks having a barrel extending axially into said cylinder;
said piston being hollow with a closed end and an open end and being telescopically slidable over said barrel;
said piston being circumferentially spaced from said barrel and slidably sealed thereto at axially spaced positions, defining a cushion chamber between the piston and barrel;
a source of liquid beverage connected to said liquid inlet;
a source of pressurized gas connected to said pump unit;
valve means in said pump unit for controlling the flow of pressurized gas to drive said piston to the extended position, and for conducting gas into said cushion chamber to return the piston to the retracted position in a continuous cycle;
and actuating means coupled to said source of pressurized gas for initiating the cycle of piston motion.

3,981,415
DISPENSER WITH EXPANSIBLE MEMBER AND CONTRACTING FABRIC

John Rayford Fowler, Wilmington, Del., and Edward Merrick Hogan, Landenberg, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 29, 1975, Ser. No. 626,964
Int. Cl.² B65D *35/28*, *35/56*
U.S. Cl. 222—95 **10 Claims**

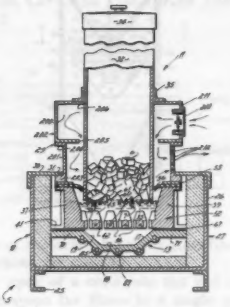


1. In a fluid dispensing container comprising a volume-expansible member for receiving and holding said fluid and means for forcing said volume-expansible member to contract in volume so as to dispense said fluid therefrom, the improvement comprising an expansible fabric disposed about said volume-expansible member and having a uni-directional recovery force to contract said volume-expansible member sufficiently to substantially empty it of said fluid, thereby serving as said forcing means, said fabric comprising elastomer yarn supplying said recovery force to said fabric and yarn in engagement with said elastomer yarn to maintain the position of said elastomer yarn in the fabric during expansion and contraction of said fabric so as to prevent blow-out of said volume-expansible member.

3,981,416
APPARATUS FOR MELTING AND DISPENSING THERMOPLASTIC MATERIAL

Charles H. Scholl, Vermilion, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Continuation-in-part of Ser. No. 549,189, Feb. 12, 1975. This application June 4, 1975, Ser. No. 583,586
Int. Cl.² B67D *5/62*
U.S. Cl. 222—146 R **7 Claims**



1. An apparatus for converting solid thermoplastic material to molten thermoplastic material and for dispensing the molten thermoplastic material, comprising
a housing including a hopper having side walls for receiving solid thermoplastic material,
a flow through grid melter having a continuous side wall, a bottom wall, and a open top for receiving said solid thermoplastic material from said hopper, said bottom wall comprising a plurality of spaced heating sections,
a plurality of discharge openings in said bottom wall of said grid melter between said spaced heating sections,
a reservoir mounted beneath said grid melter and adapted to receive molten material from said discharge openings of said grid melter,
means for heating said bottom wall of said grid melter,
a dispenser operable to dispense said molten thermoplastic material,
a pump for supplying said molten thermoplastic material from said reservoir to said dispenser, and
cooling means for maintaining said hopper side walls below the solidification temperature of said molten material so as to prevent the melt back of molten material from said grid melter into said hopper, said cooling means comprising
a shroud surrounding at least the lower portion of said hopper, said shroud defining an air chamber between the inner walls of said shroud and the outer walls of said hopper, and air flow means for supplying a flow of forced air through said air chamber so as to cool the lower portion of said hopper.

3,981,417

SYSTEM FOR AERATING AND FLUIDIZING PARTICULATE MATERIAL

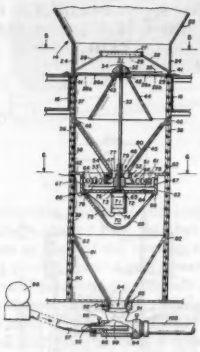
Arthur L. Fassauer, Canyon, Tex., assignor to Fassauer Industries, Inc., Canyon, Tex.

Continuation of Ser. No. 290,648, Sept. 20, 1972, Pat. No. 3,804,303, which is a continuation-in-part of Ser. No. 121,254, March 5, 1971. This application Feb. 11, 1974, Ser. No. 441,427

The portion of the term of this patent subsequent to Apr. 16, 1990, has been disclaimed.

Int. Cl.[2] B67D 5/54

U.S. Cl. 222—193 4 Claims



1. A particulate material aeration and fluidization system comprising:

an upper aeration and fluidization chamber including a substantially horizontally disposed circular plate having inner and outer concentric circular regions with a plurality of apertures formed through the plates in the outer region;

a first thin, elongate agitation member mounted for rotation around a path extending substantially across the outer region of apertures and some predetermined distance above the plate of the first aeration and fluidization chamber to aerate and agitate particulate material in the chamber and to cause particulate material to flow from the chamber through the apertures in the plate;

a stationary upper conical member tapering downwardly and outwardly under a number of the apertures in the outer region whereby particulate material flowing through the apertures of said plate is diverted by said outer conical member;

a lower aeration and fluidization chamber including a lower conical member surrounding the outer region of apertures formed through said plate with its upper end adjacent the lower end of the upper conical member to define an annular passageway therebetween and tapering downwardly and inwardly to a particulate material outlet, whereby the volume of particulate material flowing through the apertures of said plate is directed downwardly and inwardly to said outlet; and

a second thin, elongate agitation member supported for rotation around a path extending adjacent to and spaced from said lower conical member of said lower aeration and fluidization chamber to aerate and agitate particulate material by loosening said material adjacent to the inner wall of the second chamber and to feed particulate material through the outlet.

3,981,418

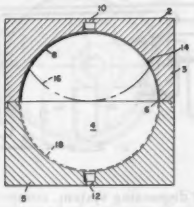
EXPULSION DEVICE

Clyde E. Williamson, Los Angeles, and Louis A. Rosales, Manhattan Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Nov. 18, 1966, Ser. No. 596,052

Int. Cl.[2] F23K 5/00

U.S. Cl. 222—386.5 3 Claims



1. A fluid expulsion device comprising:

a container;

inlet means for introduction of a first fluid into said container;

an outlet for expulsion of a second fluid from said container; and

a diaphragm within and electrodeposited on the interior wall of said container for separating said first and second fluids, said diaphragm being bonded over substantially its entire surface to the interior wall of said container, whereby said diaphragm will peel smoothly from said container when said second fluid is expelled through said outlet in response to said first fluid being introduced into said container.

3,981,419

SELF-CLOSING CLOSURES

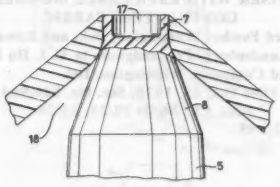
Billy N. Nilson, Mjolby, Sweden, assignor to KeNova AB, Malmo, Sweden

Filed Apr. 1, 1975, Ser. No. 564,079

Claims priority, application Sweden, Apr. 8, 1974, 7404749

Int. Cl.[2] B65D 35/50

U.S. Cl. 222—494 8 Claims



1. A closure for use with a container, the closure opening in response to pressure upon the contents of the container, and being self-closing upon the release of pressure, said closure comprising a first part having a discharge opening, and a second part having a projection extending toward said opening in said first part and closing said opening when said closure is in the closed position, said discharge opening having a substantially cylindrical shape and changing at the interior of the opening to an annular, curved convex surface, said projection having a substantially cylindrical tip sized to be sealingly received in the cylindrically shaped discharge opening in the closed position of said closure and a conical portion diverging outwardly from said cylindrical tip for establishing linear sealing contact with the annular convex surface of said discharge opening in the closed position of said closure, whereby

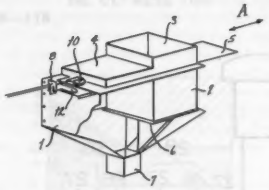
sealing engagement between the projection and the discharge opening is attained at two places.

3,981,420

PULL MEANS FOR SLIDABLE MEMBER FOR DOSING DEVICE

Louisa Josephina Smits-Geurts, Dorpstraat 48, Borkel en Schaft, Netherlands

Filed Jan. 20, 1975, Ser. No. 542,368
Int. Cl.² B67D 3/00
U.S. Cl. 222—505 6 Claims



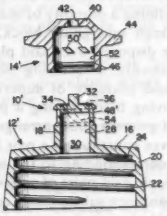
1. A slidable member for use in conjunction with the supporting frame of a dosing device for dispensing a select quantity of granular material, said slidable member being adapted for reciprocal movement in opposing directions with respect to the supporting frame of the dosing device, the improvement which comprises a rope means, pulley means connecting with said supporting frame and having a rope means arranged thereon, said rope means as arranged upon the pulley means forming a pair of rope sections that extend substantially parallel to each other and away from the supporting frame, a plate means secured to the said slidable member, there being a pair of holes provided in said plate means, one of said rope sections being arranged through said pair of holes to adjustably secure the rope means thereto, whereby upon a pull of one of the rope sections the said plate means and slidable member will be displaced in one of the opposing directions.

3,981,421

NONSPURTING DISPENSING CLOSURE

John David McDowell, Jr., Cincinnati, and Paul John Nutley, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed June 30, 1975, Ser. No. 592,007
Int. Cl.² B65D 47/26
U.S. Cl. 222—521 10 Claims



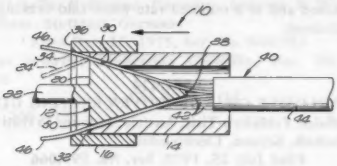
1. In a dispensing closure having a generally cylindrical chimney portion projection from a shell member and a tip member with a generally cylindrical bore slidably disposed thereon having a generally central dispensing opening and movable between an extended open position and a telescoped closed position and wherein there is provided an undercut generally annular groove extending generally peripherally around the shell member chimney portion and means carried by the tip member within said bore thereof for engagement within said groove to limit movement of said tip member relative said shell member to movement between the open and closed positions thereof, the improvement comprising means for restricting the movement of the tip member relative the shell member chimney portion to a low angle slight twisting motion during push-pull movement to thereby reduce spurting of product during opening movement thereof; said movement restricting means comprising at least one high slope angulated rib extending across and only partially around said shell member chimney portion undercut groove and a pair of circumferentially spaced apart lugs carried by said tip member extending into said bore thereof for engaging said at least one rib on opposite sides thereof to impart said slight twisting motion to said tip member during movement thereof between said open and said closed positions.

3,981,422

METHOD OF BREAKING GLASS FIBERS AND TOOL THEREFOR

John R. Moore, Santa Ana, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 18, 1975, Ser. No. 597,096
Int. Cl.² C03B 33/02; B26F 3/00
U.S. Cl. 225—2 14 Claims



1. A method of uniformly breaking glass fibers in a bundle of fibers comprising the steps of:

inserting the apex of a cone into the end of a bundle of fibers to position the fibers in a single layer about the surface of the cone with the free ends of the fibers extending beyond the base of the cone;

shifting a sleeve surrounding said bundle forwardly toward said base to firmly grip the fibers between the end of the sleeve and said cone; and

severing the ends of the fibers extending beyond said base.

3,981,423

TWO SPEED PLANETARY GEAR TRAIN

Henry Jacob Koeber, Deerfield, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Apr. 17, 1975, Ser. No. 568,879
Int. Cl.² B65H 23/22
U.S. Cl. 226—42 8 Claims

1. An improvement in a motion picture camera having an image recording station past which film is moved intermittently and spaced therefrom, a sound recording station past which the film is moved constantly, the film path between the stations including a film loop, the improvement comprising:

a single motor for driving the film through both said stations;

a film moving mechanism at said sound recording station;

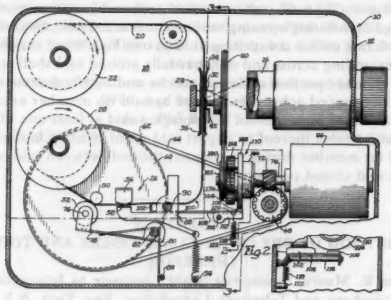
a constant speed transmission coupling said motor to said film moving mechanism at said sound recording station;

a speed change assembly coupling said motor to said film moving mechanism at said image recording station;

said speed change assembly including a braking disc having fixed thereto at least a pair of stud shafts about each of which an idler gear is rotatable, said idler gears being nonrotatably revolved on said braking disc when said braking disc is unrestrained, and being non-revolvably rotated when said braking disc is restrained; and

film loop sensor means for selectively engaging said braking disc of said speed change assembly to affect the rate of

operation of said film moving mechanism at said image recording station, whereby said film moving mechanism



is operated at a first rate when said braking disc is unrestrained and at a reduced rate when said braking disc is restrained.

3,981,424

EXPLOSIVE CHARGE DRIVEN SETTING GUN

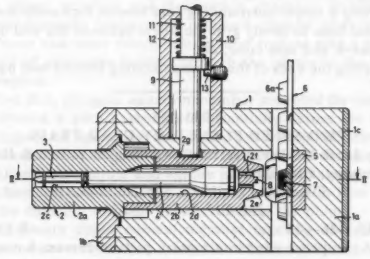
Elmar Maier, Feldkirch-Tisis, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed July 25, 1975, Ser. No. 599,066

Claims priority, application Germany, July 29, 1974, 2436446

Int. Cl.² B25C *1/14*

U.S. Cl. 227—10 24 Claims



1. An explosive charge driven setting gun for firing an explosive charge and using force generated by the explosive charge for driving fastening elements and the like into a receiving material, comprising a housing having a bore extending in the firing direction of the gun, said bore having a rear end and a front end spaced in the firing direction from said rear end, a barrel axially displaceably mounted within the bore in said housing, said barrel having a forward end facing in the firing direction and a rearward end facing in the opposite direction, a breech block positioned in said housing at the rear end of said bore and in alignment with said barrel, said breech block arranged to support a propellent charge, wherein the improvement comprises means formed on the rearward end of said barrel for firing the propellent charge supported on said breech block when said barrel is displaced rearwardly against said breech block.

3,981,425

DEVICE FOR ASSEMBLING STRUCTURAL MEMBER

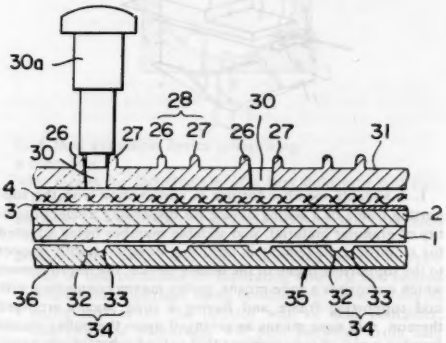
Naomitsu Megumi, Funabashi, Japan, assignor to Tokyo Plywood Kabushiki Kaishi, Tokyo and Naomitsu Megumi, Funabashi, both of, Japan

Division of Ser. No. 404,163, Oct. 9, 1973. This application Apr. 24, 1975, Ser. No. 571,119

Claims priority, application Japan, Oct. 25, 1972, 47-106851; Oct. 25, 1972, 47-106852

Int. Cl.² B25C *7/00*

U.S. Cl. 227—155 4 Claims



1. A device for manufacturing a composite structural member of the type made up of a plurality of superimposed structural elements secured together by staples comprising a guide block having an upper surface, a plurality of individual rails projecting from said upper surface, said rails being arranged in pairs with the two individual rails constituting a pair being separated from one another by a first elongated space, said first elongated space and the pair of rails defining said first elongated space forming an elongated groove on said top surface of said guide block, said pairs of rails being separated from each other by a second elongated space parallel to said first elongated space, means disposed along the bottom of said elongated groove defining a plurality of spaced openings passing completely through said guide block, said guide block being adapted to be disposed over said plurality of superimposed structural elements, a receiving block adapted to be disposed beneath said plurality of superimposed structural elements, said receiving block having a plurality of grooves formed therein, said grooves being arranged in pairs with the two individual grooves constituting a pair having a combined width substantially corresponding to the width of said openings in said guide block, said pairs of grooves being separated from one another a distance substantially corresponding to the distance between said elongated grooves on said guide block, said receiving block being disposed relative to said guide block such that said elongated grooves on said guide block generally overlie said pairs of grooves on said receiving block, whereby staples are adapted to be passed through said spaced openings in said elongated grooves in said guide block, pass through said superimposed structural elements, and engage said grooves in said receiving block such that upon engaging said grooves, the staples are turned laterally to thereby close the staple and secure together said plurality of superimposed structural elements.

3,981,426

CORROSION-RESISTANT STRUCTURAL SHAPE CLAD BY ROLLING AND WELDING AND COMPRISING A BASE MATERIAL AND A CLADDING MATERIAL AND METHOD OF PRODUCING SUCH A STRUCTURAL SHAPE

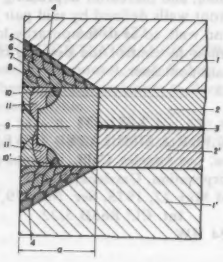
Giswalt Veitl, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Dec. 4, 1974, Ser. No. 529,296

Claims priority, application Austria, Dec. 17, 1973, 10532/73

Int. Cl.² B23K *1/20*

U.S. Cl. 228—118 5 Claims



1. In a method of producing a corrosion-resistant structural shape that is clad by rolling and welding, and which comprises a base material of austenitic manganese steel and a cladding material containing alloy elements tending to phase precipitations, said structural shape being formed from a cladding pile of a certain circumference with a sandwich-like construction composed of two outer base material plates and two inner cladding sheet bars having smaller dimensions than the base material plates so that the base material plates overhang the cladding sheet bars, a separating layer being inserted between the cladding sheet bars for preventing said cladding sheet bars from being welded together, a gap formed by the overhang of the base material plates surrounding the cladding sheet bars and being closed all around by weld strips welded together with the base material plates, the improvement comprising:

grinding a bevel into the base material plates at their edges, said bevel extending over substantially all of the overhang of the base material plates,

replacing ground-off material by building-up a plurality of welding layers of carbon steel,

composing the pile and inserting the weld strips,

connecting the weld strips, by means of root seams along the circumference of the pile, with the built-up welding layers, and

tightly closing the gap by applying further welding layers between the built-up welding layers and the weld strips, whereby the pile is completed.

3,981,427

METHOD OF LAMINATING GRAPHITE SHEETS TO A METAL SUBSTRATE

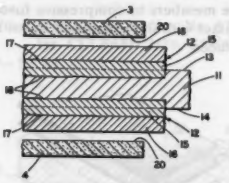
Ronald R. Brookes, 303 Cordelia Ave. SW., North Canton, Ohio 44720

Filed Apr. 28, 1975, Ser. No. 572,319

Int. Cl.² B23K *31/02, 19/00, 35/22*

U.S. Cl. 228—122 11 Claims

1. The method of coating sheet steel base material with graphite, which includes the steps of providing a steel sheet having an intermetallic phase bonded tin coating on at least one side of the steel base; placing a graphite sheet on the tin coated side of the steel base sheet to form a sandwich pack; pressing the tin coated and graphite sheets of the pack together while conductively heating the pack to a temperature slightly higher than the melting point of tin penetrating the graphite sheet with liquidus tin resulting from the heating, while maintaining the heated pack under pressure; and then



cooling the sandwich pack under pressure to solidify the liquidus tin to form a bond between the graphite sheet and the tin coating on the steel base material.

3,981,428

METHOD FOR CRACK-FREE JOINING OF TUBES FOR A WEARING INSERT FOR SCREW CONVEYORS

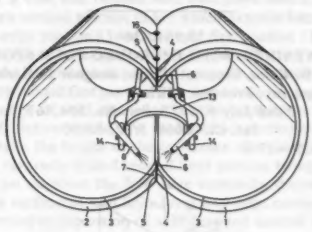
Fritz Przybylla, Heilbronn, Germany, assignor to Werner & Pfleiderer, Stuttgart, Germany

Filed Dec. 15, 1975, Ser. No. 640,853

Claims priority, application Germany, Dec. 20, 1974, 2460316

Int. Cl.² B23K *1/14*

U.S. Cl. 228—175 8 Claims



1. A method for crack-free joining of tubes cut along secants and pressed together along the secant surfaces to form relatively pointed saddles with application of heat and additional products, said tubes being provided on the inside with a wearing coating, said tubes serving as a wearing insert for housing of plural-screw screw conveyors, the method comprising:

joining the tubes lengthwise with solder being used as the additional product and by the heat being provided in the area of a saddle from the inside of the tubes and symmetrically with respect to the saddle.

3,981,429

METHOD FOR PLATED FOIL LIQUID INTERFACE DIFFUSION BONDING OF TITANIUM

Elmo G. Parker, La Mesa, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Continuation of Ser. No. 81,262, Oct. 16, 1970, abandoned. This application Jan. 29, 1973, Ser. No. 327,341

Int. Cl.² B23K *31/02*

U.S. Cl. 228—194 12 Claims

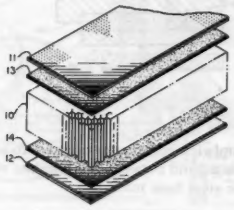
1. The method of plated foil liquid interface diffusion bonding of two titanium base members which comprises:

a. providing a thin plated titanium base foil having a thickness of the order of less than 0.001 inch.

b. placing on at least one side of said foil laminar diffusion bridge materials consisting of successive plating layers of Cu-Ag-Ni plated thereon in the order named,

c. interposing said plated foil between the faying surface of said base members,

d. subjecting the members to compressive force urging the same into contact with the interposed foil at their respective foil interfaces,



e. heating the members and foil in a protective atmosphere to a temperature of the order of 1450°F. to 1800°F. which is sufficient to form a liquid interface diffusion bridge at each said interface of the members and foil, and

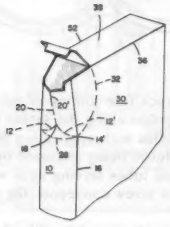
f. continuing and holding said heating at a temperature level and for a period of time sufficient to cause atomic transport of the titanium of the foil and members across said interfaces therebetween to form a bonding zone at each interface in which the titanium of the foil and member is diffused and in which the diffusion bridge materials are diffused and diluted throughout the zone.

3,981,430

CONTAINER WITH IMPROVED POUR SPOUT

Cameron D. Keim, Fremont, Mich., assignor to Gerber Products Company, Fremont, Mich.

Filed July 9, 1975, Ser. No. 594,467
Int. Cl.² B65D *5/72, 83/00*
U.S. Cl. 229—17 R **9 Claims**



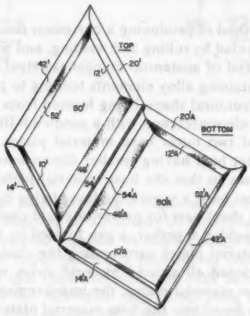
1. A container for holding a mass of a flowable material comprising back and front walls, at least one end wall and top end flaps hingedly attached at one end of said walls, each said back and front wall being contiguous with said end wall through respective of generally upright side margins, a break-away tab formed in part by a tear line in said end wall, said tab further being formed by the hinged attachment of said end wall to a first top end flap; a pair of top end flaps hingedly attached to said back and front walls, and overlapping said first top end flap, each of said pair of top end flaps being joined to respective of said back and front walls in part by a tear hinge extending therebetween for a distance corresponding to the depth of the said first top end flap, said back and front wall top end flaps being further provided with a fold line transverse to said tear hinge; a first pair of arcuate fold lines provided in respective of said back and front walls, each of said pair of arcuate fold lines having one end thereof intersecting with the upright side margin between said end wall and respective of said back and front walls, and the other end thereof intersecting the transverse fold line at the respective top end flap, said end wall having a second pair of fold lines extending upwardly from respective side margins and being convergent relative to each other intermediate said side margins at a location near said break-away tab, each said back, front and end wall being formed of a material having sufficient flexibility to permit the back and front walls to be moved toward each other while simultaneously allowing the end wall to flex outwardly along said fold lines, whereby when said carton is filled with flowable materials, the particles can be dispensed from said carton by first separating said tab along the tear line in said end wall and said tear hinges in said pair of top end flaps, then by bending said tab upwardly about said transverse fold line, and thereafter depressing the portions of said back and front walls defined by said pair of arcuate fold lines and said end wall, so as to temporarily lock into a pour spout configuration to control the pouring of said flowable material from said container.

3,981,431

BLANK FOR A SIMULATED JEWEL BOX

Glen Matsuyama, Los Angeles, Calif., assignor to Graphic Arts Packaging Corporation, Gardena, Calif.

Filed May 22, 1975, Ser. No. 579,787
Int. Cl.² B65D *5/22*
U.S. Cl. 229—34 HW **1 Claim**



1. A one-piece blank for forming a generally rectangular box having identical top and bottom sections hinged to one another along a common edge, the blank including: a first rectangular panel and a second rectangular panel; a first pair of end flaps integral with the first panel and separated therefrom and from one another by respective scorelines; a second pair of end flaps integral with the second panel and separated therefrom and from one another by respective scorelines; a third pair of intermediate flaps integral with the first and second panels and separated therefrom and from one another by respective scorelines to permit the first panel to be folded over the second panel; a pair of further panels formed at each end of the first panel respectively adjacent to one of the flaps of the first pair and one of the flaps of the third pair and separated from the first panel by respective scorelines to permit the first panel to be moved into a shallow rectangular well against the second panel with the last-named flaps of the first and third pairs forming end rims for the well and with the further panels forming end walls for the well; first and second pluralities of side flaps formed integral with the respective sides of the second panel and separated therefrom by respective scorelines to permit the side flaps of the first and second pluralities to be folded over one another to form side rims and side walls for the well; said one of the end flaps of said first pair and said one of the end flaps of said second pair having side sections extending along the respective sides of the first

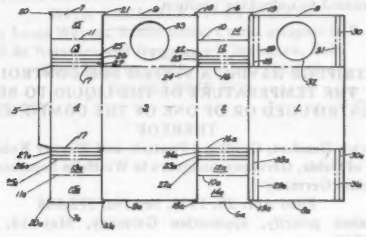
panel and separated therefrom by respective slits, each of said side sections having an integral flap separated therefrom by a scoreline to be folded under the side flaps of the first and second pluralities to constitute reinforcement for the side rims and side walls of the well; and an identical one-piece blank having first and second panels of rectangular shape, and a second pair of end flaps integral with the second panel thereof and separated therefrom and from one another by respective scorelines, and in which the other one of said last-named flaps is integral with the end flaps of the second panel of the first-named blank and separated therefrom by a scoreline, the first-named blank forming a top for the box and the second-named blank forming a bottom for the box, and said last-named scoreline forming a hinge for the top and bottom.

3,981,432

CARTON WITH TIGHTLY SEALED END CLOSURES

Frank D. Bergstein, Cincinnati, and Robert W. Nerenberg, Middletown, both of Ohio, assignors to Bergstein Packaging Trust, Middletown, Ohio

Filed May 8, 1975, Ser. No. 575,518
Int. Cl.² B65D *5/02, 5/64, 43/00*
U.S. Cl. 229—37 R **12 Claims**



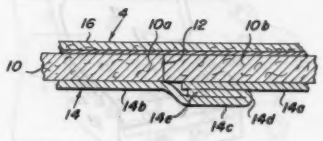
1. In a seal-end paperboard carton having enclosing body wall panels defining the carton body and end closure flaps hingedly connected to the end edges of the body wall panels, an improved sift-proof end closure construction comprising an opposing pair of innermost closure flaps and an opposing pair of outermost closure flaps, said pairs of closure flaps being hingedly connected to the carton body wall panels along scored lines of articulation defining inwardly projecting ridges, said innermost closure flaps being divided by scored lines of articulation into first and second parts, with the second parts slightly wider than the first parts so that when the second parts are infolded relative to the first parts the free side edges of the second parts will overlie the ridges defined by the lines of articulation between the first parts and the body wall panels to which they are connected, said second parts being infolded and adhesively secured to the first parts to form double thickness innermost flaps, whereby when said double thickness innermost closure flaps are infolded to overlie the open end of the body, the free side edges of the second flap parts will enter into wedging engagement with said ridge-defining lines of articulation, such wedging engagement acting to urge the said innermost flaps upwardly to provide pressure resistive planar supports over which the outermost flaps may be folded and the flaps tightly secured together throughout their contacting areas.

3,981,433

ONE-STEP EASY-OPEN CONTAINER FOR REFRIGERATED DOUGH PRODUCTS AND THE LIKE

Dewey B. Thornhill, St. Louis, Mo., and Ralph E. Frank, Jr., New Albany, Ind., assignors to Boise Cascade Corporation, Boise, Idaho

Filed Sept. 15, 1975, Ser. No. 613,201
Int. Cl.² B65D *3/26, 85/36*
U.S. Cl. 229—51 BP **9 Claims**



1. A cylindrical easy-open container consisting solely of:

a. a helically-wound cylindrical body wall layer (**10**) formed of fibrous material having a helical butt joint extending continuously the length thereof, the adjacent edge portions (**10***a*, **10***b*) of said body wall layer defining said butt joint being contiguous and unbonded;

b. a correspondingly helically-wound impervious liner layer (**14**) secured to and coextensive with the inner surface of said cylindrical body wall layer to bridge the butt joint, one edge portion (**14***a*) of said liner layer terminating adjacent and short of a first side of said butt joint, the other edge portion (**14***b*) of said liner having a first portion (**14***c*) which extends from the other side of said butt joint across and beyond said butt joint, and a reversely folded second portion (**14***e*) which extends between said one edge portion (**14***a*) and said first portion (**14***c*) back toward, and terminates short of, said butt joint, the length of said second portion (**14***e*) extending substantially the length of said first portion (**14***c*) and terminating adjacent the edge of said one edge portion (**14***a*), the fold line (**14***d*) between said first and second portions extending helically the length of the container, the outer surface of said reversely folded second liner portion being secured, at least adjacent the free edge extremity thereof, to the inner surface of said liner layer one edge portion to permit relative expansion of said first and second liner portions;

c. a removable outer layer (**16**) extending across the outer surface of said butt joint and secured to the outer surfaces of the abutting edge portions of said body wall layer substantially throughout the length of said butt joint, thereby to maintain together the body wall edge portions defining said unbonded butt joint; and

d. end closure means (**6, 8**) for closing the ends of said body wall layer, said outer layer being removable from said body wall layer to permit opening of the butt joint and expansion of the liner layer to cause separation of the first and second portions thereof, thereby to automatically open said liner layer along a helical path.

3,981,434

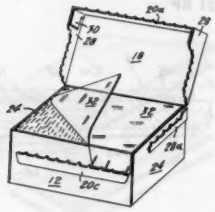
EASY OPENING CARTON FOR FROZEN COMESTIBLE

Gary Allen Ramich, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Apr. 10, 1975, Ser. No. 566,835
Int. Cl.³ B65D *5/02, 17/12*
U.S. Cl. 229—51 TS **5 Claims**

1. A paperboard carton for ice cream comprising a front wall, a bottom wall, a rear wall, opposed end walls and a top cover panel hingedly attached along one edge to the upper edge of the back wall and having a front cover panel hingedly attached to the opposite edge of said top cover panel and overlapping the upper portion of the front wall when the

carton is erected, said front cover panel being separated by a pair of spaced upper and lower weakness lines substantially parallel to the hinge line between said top cover panel and said front cover panel into an upper cover front skirt portion, an intermediate detachable portion and a lower bonding portion adhesively bonded to said front wall,



and a flexible, water-resistant liner sheet adhered along one edge thereof to the interior surface of said back wall, said sheet extending to substantially completely cover the interior surface of said top cover panel and being adhered along the opposite edge thereof to the inner surface of said front cover panel in an area below said upper weakness line.

3,981,435

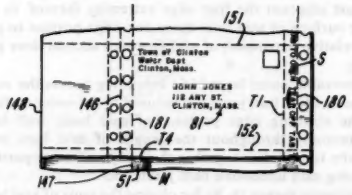
CONTINUOUS BUSINESS FORM OR THE LIKE ADAPTED FOR SUBSEQUENT PROCESSING INTO COMBINATION MAILING ENVELOPES AND RETURN ENVELOPES HAVING A COMMON BACK PLY PANEL

Edward L. Johnsen, 12 Fox Meadow Lane, Wayland, Mass. 01778

Continuation of Ser. No. 433,462, Jan. 15, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,490

Int. Cl.² B65D *27/06, 27/10, 27/34*

U.S. Cl. 229—69 **15 Claims**



1. As a new article of manufacture a continuous series of blanks each suited for subsequent processing into a combination mailing envelope and return envelope having a common back ply panel, said article comprising a series of transversely spaced interconnected blanks each having a back ply panel common to both the mailing envelope and the return envelope, a front ply panel of the mailing envelope integral with said back ply panel; an intermediate, discardible panel integral with and disposed between the front end back ply panels, said intermediate panel separating said front and back ply panels from one another; a front ply panel of the return envelope disposed in registered overlying relationship with three edges of said back ply and having one marginal edge spaced inward from the adjacent marginal edge of said back panel; and adhesive means interposed between and bonding the registered marginal edges of said front ply panel of the return envelope and said back ply panel to one another defining a return envelope pocket open along said one marginal edge.

3,981,436

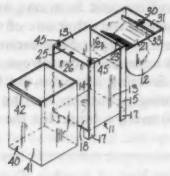
MAIL BOX

Louis A. Neal, 57 Hopson Ave., Branford, Conn. 06405

Filed June 26, 1975, Ser. No. 590,519

Int. Cl.² B65D *91/00*

U.S. Cl. 232—17 **4 Claims**



1. A mail box comprising a base, a hood and a removable receptacle, the base being generally rectangular and having an open front, the receptacle being adapted to fit within the base and having a front wall adapted to close the open front of the base, and the hood being hinged to the base for movement between open and closed positions, one lower edge of the hood being adapted to engage the front wall of the receptacle when the hood is closed, and the hood being provided with locking means for securing the hood in closed position, the base including a locking bar defining the top of the open front, and the locking means including a hook adapted to engage said bar in locking position and a cam adapted to lift the hood to free the front wall of the receptacle when the locking means is actuated to unlocking position.

3,981,437

CENTRIFUGE HAVING A SYSTEM FOR CONTROLLING THE TEMPERATURE OF THE LIQUID TO BE CENTRIFUGED OR OF ONE OF THE COMPONENTS THEREOF

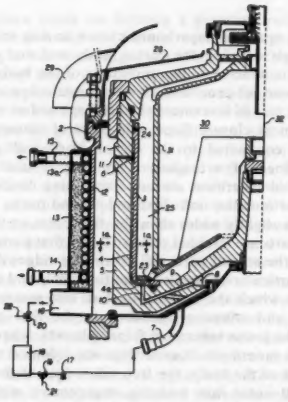
Heinrich Hemfort; Gunthard Pautsch, and Werner Kohlstette, all of Oelde, Germany, assignors to Westfalia Separator AG, Oelde, Germany

Filed Apr. 28, 1975, Ser. No. 572,688

Claims priority, application Germany, May 14, 1974, 2423319

Int. Cl.² B04B *15/02*

U.S. Cl. 233—11 **6 Claims**



1. A centrifuge for separating a specifically heavier material from a specifically lighter liquid phase with means for controlling the temperature of material centrifuged comprising a drum for the centrifuging which is rotatably mounted, a sta-

tionary frame jacket surrounding the drum and spaced therefrom, an inlet to the drum for introduction of material to be centrifuged, and an outlet for the liquid phase from which the specifically heavier material has been separated by centrifuging, said temperature control means comprising:

a. an insert disposed within and about the drum adjacent the drum periphery and supported on the drum walls at a plurality of circumferentially spaced locations and spaced therefrom providing passages for a heat exchange medium between the drum wall and the insert for controlling the temperature of material being centrifuged, and means sealing said passage from the drum interior,

b. inlet means and outlet means communicating with said passage for flow of heat exchange medium through the passage,

c. heat transfer means mounted on the stationary frame for controlling the temperature in the space between the drum and frame,

d. said outlet means from the insert communicating the passage between the drum and insert with the space between the drum and frame for flow of the heat exchange medium through said space for temperature control thereof, and

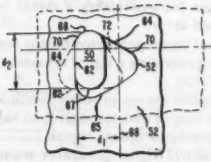
e. means for circulating said heat exchange medium which has passed through said space from said space to the inlet of said passage between the drum and insert.

3,981,438

CENTRIFUGE ROTOR HAVING SWINGING MEMBERS WITH VARIABLE PIVOT POINTS

Oakley Louis Weyant, Sandy Hook, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 19, 1975, Ser. No. 588,646
Int. Cl.² B04B *5/00*
U.S. Cl. 233—26 **7 Claims**



1. In a swinging bucket type rotor adapted to spin about a vertical axis with buckets disposed peripherally and pivotally about said rotor and adapted in use to pivot outwardly and upwardly, each said bucket having a longitudinal axis through its center of mass which axis is generally vertically oriented when said rotor is at rest, the combination comprising:

pivot means peripherally disposed on said rotor, each having a vertically elongated cross-section, for pivotally supporting each said bucket,

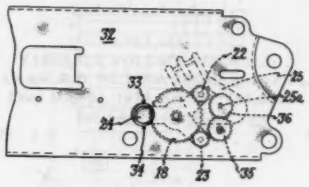
a tab on each said bucket, said tab defining a pair of intersecting, downwardly opening, cam edges contacting said pivot means, the intersection of said cam edges lying on one side of said longitudinal axis, one of said cam edges extending to the other side of said longitudinal axis, such that the effective pivot point of said bucket shifts relative to said longitudinal axis as said bucket swings outwardly.

3,981,439

UNIDIRECTIONAL DRIVE ASSEMBLY FOR A GEAR DRIVEN METER REGISTER

Donald M. Ham, Rochester, N.H., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 4, 1975, Ser. No. 610,486
Int. Cl.² G06M *1/00*
U.S. Cl. 235—91 R **14 Claims**



1. A unidirectional drive assembly for a gear driven meter register that is adapted for use with a meter having a register drive gear comprising:

an idler gear shift assembly coaxially mounted in nesting relationship with a ratio gear assembly between supporting members of a frame assembly on which said gear assemblies are rotatably mounted,

in combination with a register indicator gear assembly for rotating an indicator, and a third idler gear rotatably mounted in continuous meshing engagement with a gear in said register indicator gear assembly,

said idler assembly having first and second idler gears rotatably mounted in selectively interruptible engagement, respectively, with said gear on said register indicator gear assembly and with said third idler gear,

said idler gear shift assembly being operable to move said first idler gear into meshing engagement with said gear on the register indicator gear assembly responsive to rotation of said ratio gear assembly in a forward direction, and being further operable to move said second idler gear into meshing engagement with said third idler gear responsive to rotation of said ratio gear assembly in a reverse direction,

whereby said indicator register gear is driven in an up-scale direction by said idler gear assembly responsive to rotation of said ratio gear in either direction.

3,981,440

DIGITAL SIGNAL DETECTOR

Alexander Laidlaw Richardson, Livingston, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 25, 1974, Ser. No. 508,926
Int. Cl.² H03K *5/20*
U.S. Cl. 235—92 FQ **6 Claims**

1. An apparatus for recognizing a plurality of digital signals having different pulse widths or pulse repetition intervals comprising:

a presettable digital counter;

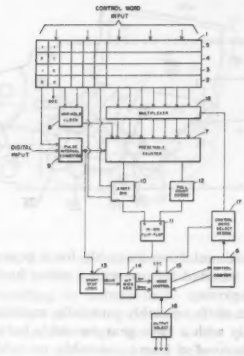
a memory containing a plurality of binary code words, which code words contain the binary complement of the interval to be measured, said memory coupled to said presettable counter for loading said complement into said presettable counter;

means for receiving digital input signals to be measured, said digital signals including pulses and intervals between pulses;

pulse interval converter means coupled to said receiving means, said memory, and said presettable counter for inverting said digital input signal when a current code word indicates that an interval between pulses is to be measured;

logic means coupled to said presettable counter for generating a signal corresponding to an acceptable time interval within which a desired input interval must end;

means coupled to means for receiving for indicating when an input interval has terminated;



means for generating an ouput when said indication occurs during said acceptable time interval; and

means for varying said acceptable time interval.

3,981,441

COUNTERS

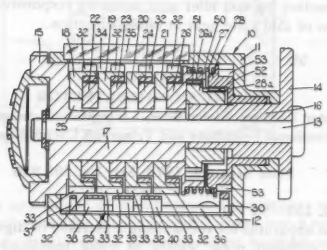
John Benjamin Leslie Walters, Walsall, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed May 27, 1975, Ser. No. 580,721

Claims priority, application United Kingdom, June 14, 1974, 26435/74

Int. Cl.² G01C *22/00;* **G06C** *15/42*

U.S. Cl. 235—103 **13 Claims**



1. A counter comprising a body, a set of co-axially disposed discs, a plurality of numerals around a periphery of each said disc, a window in said body for displaying a numeral on each disc, friction drive means for frictionally rotating said discs, a rotary counting member for operating said friction drive means in a counting direction, a reset member for operating said friction drive means in a reset direction, a plurality of first abutment means on each said disc of said set except for one of said discs at one end of said set, said first abutment means being disposed between adjacent numerals on each said disc, a plurality of resilient stop means each adapted to engage first abutment means on a respective one of said discs, except for said one of said discs at one end of said set, to prevent rotation of said respective one of said discs in the counting direction but to allow rotation of said discs in the opposite or reset direction, a second abutment means on each said disc of said set, and a plurality of resilient detent means respectively adapted to engage said second abutment means on each of said discs so as to allow rotation of said discs in the counting direction but to stop said discs at a predetermined point of their rotation in said opposite reset direction, and a spring blade serving to attach each said stop means to said body, wherein the improvement comprises each said resilient detent means is mounted on the spring blade on which is mounted said stop means of an adjacent disc, the arrangement being such that riding movement of each said detent means over its respective second abutment means causes it to move the respective stop means out of engagement with one of said first abutment means on said adjacent disc.

3,981,442

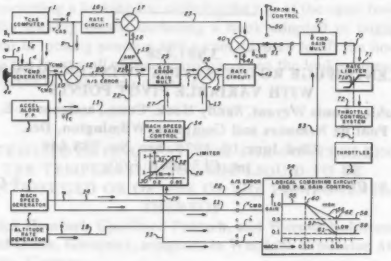
AIRCRAFT ENGINE AUTOMATIC THROTTLE CONTROL WITH AUTOMATIC GAIN PROGRAMMING SYSTEM

Harry D. Smith, Scottsdale, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,082

Int. Cl.² B64C *13/18*

U.S. Cl. 235—150.2 **11 Claims**



1. In a variable gain engine throttle control system for an aircraft:

computer means for generating a signal representative of craft air speed error,

first gain control signal generator means responsive to craft air speed for generating a signal representative of craft air speed,

first gain multiplier means in series relation with said computer means output and responsive to said first gain control signal generator means signal,

second gain control signal generator means responsive to said computer means output, to a signal representative of commanded craft air speed, to a signal representative of craft altitude rate, and to a signal representative of craft air speed for generating a composite control signal,

second gain multiplier means in series relation with said first gain multiplier means and responsive to said composite control signal, and

engine throttle control means responsive to said second gain multiplier means.

3,981,443

CLASS OF TRANSFORM DIGITAL PROCESSORS FOR COMPRESSION OF MULTIDIMENSIONAL DATA

Robert T. Lynch, and James J. Reis, both of Torrance, Calif., assignors to Northrop Corporation, Los Angeles, Calif.

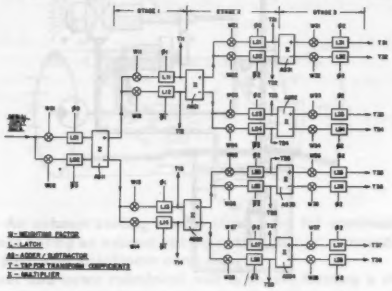
Filed Sept. 10, 1975, Ser. No. 612,090

Int. Cl.² G06F *15/34*

U.S. Cl. 235—156 **24 Claims**

1. A system for digitally implementing a class of transforms to process data in real time comprising,

a plurality of modules cascaded in stages with each stage having twice the number of modules as the preceding stage, each of said modules including a pair of latches for receiving and temporarily storing data from the preceding module, and an adder/subtractor unit having two units with each input coupled to the output of one of the associated pair of data latches, said adder/subtractor unit having a pair of outputs for providing a first output signal



corresponding to the sum of the contents of the pair of associated data latches and a second output signal corresponding to the difference of the contents of the associated pair of data latches, and

means for coupling said first and second output signals of each adder/subtractor unit to one of the two associated modules of the next succeeding stage to thereby implement the class of transformers in real time.

3,981,444

METHOD FOR STARTING A STEAM-HEATED HEAT EXCHANGER BY REGULATING THE PRESSURE OF THE HEATING-STEAM

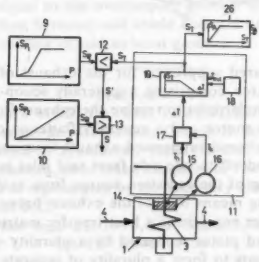
Gerhard Weiss, Oberrohrdorf, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed May 29, 1975, Ser. No. 581,794

Claims priority, application Switzerland, Dec. 12, 1974, 16518/74

Int. Cl.² F24H 9/20

U.S. Cl. 236—1 R **17 Claims**



1. Closed loop control method for starting a steam-heated heat exchanger by controlling the heating-steam pressure, where a correcting variable is established by a controller from an actual pressure value, measured by an actual pressure transmitter, and from a reference value generated by a reference value generating device and where the heating-steam pressure is modified by at least one control valve on the basis of said correcting variable, the characteristics being that the pressure reference value S is selected from three pressure set values S_T,S_{P1} and S_{P2}, that the lesser value of S_T and S_{P1} is established as an intermediate pressure set value S', that is S' = Min (S_T,S_{P1}), and the pressure reference value S is selected as being the greater value of S' and S_{P2}, that is S = Max (S', S_{P2}), where S_T represents that permissible maximum pressure set value which is a function of the momentary metal temperature T_h of the endangered component (14) where S_{P1} represents that permissible maximum pressure set value which is a function of the momentary existing quantity of working medium and thus of the momentary existing power, and where S_{P2} represents the permissible minimum presure set value as a function of the same momentary factor.

3,981,445

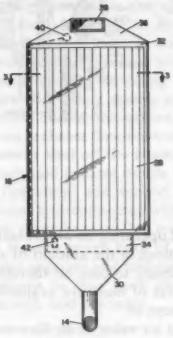
VARIABLE VOLUME AIR WALL

Warren L. Custer, R.D. No. 3, Box 205D, Ligonier, Pa. 15658

Filed May 23, 1975, Ser. No. 580,247

Int. Cl.² F24J 3/02

U.S. Cl. 237—1 A **7 Claims**



1. A temperature modifying system primarily for the periphery of a building including the combination of a heat exchange unit, ducting means, at least two windows and means for forcing air through the unit, ducting means and windows,

the ducting means being for sequentially conducting air to the heat exchange unit, the air forcing means and the windows, said ducting means being connected to each of said windows such that air from said heat exchange unit passes through only one window prior to its return to the heat exchange unit,

the windows being located in window openings in the building, at least one window being exposed to direct radiant heat from the sun and at least one other being shaded from the sun,

each window including parallel transparent panels spaced apart by means forming a substantially fluid tight enclosure with said panels, said enclosure means including aperture means at its bottom and top for ingress and egress of air from the ducting means,

one said panel being exposed to air outside the building and the other said panel being exposed to air inside the building,

aligned slat means mounted between said parallel panels for absorbing and reflecting radiant heat,

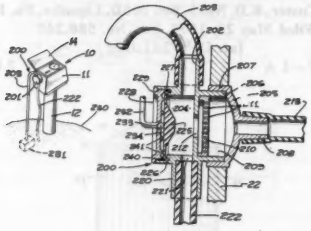
separate volume control means for the shaded window and exposed window for regulating the volume of air passing into the enclosures such that the exit temperatures of the air from the enclosures are substantially equal,

a temperature sensing device near the point of egress of the air of each said windows, said temperature sensing device being operatively connected to means for modifying the size of the ingress aperture, said modifying means increasing the size of the ingress aperture when the temperature sensing device senses an increase in temperature of the air exiting the enclosure.

3,981,446
WATER OPERATED CONTROL APPARATUS AND METHOD

Edwin J. Hunter, Rancho Santa Fe, Calif., assignor to The Toro Company, San Marcus, Calif.

Filed Aug. 22, 1974, Ser. No. 499,485
Int. Cl.² A01G *25/00*
U.S. Cl. 239—1 **17 Claims**



1. A method of operating an air pressure actuated device in response to variations in the amount of air passed through an air valve whose ability to pass air therethrough varies dependent upon the level of moisture available in its environment comprising the steps of:

connecting said air valve in air flow communication with a chamber;

establishing a vertical column of water in a conduit in fluid flow communication with said chamber whereby the weight of said column of water has an effect on the air pressure in said chamber;

placing said chamber in air pressure sensing relation with one side of a diaphragm member of said air actuated device; and

operating said device in response to variations in the resultant air pressure in said chamber caused by the combined affect thereof of said air valve and column of water.

3,981,447
RECIRCULATORY APPARATUS FOR SPRAYING MOULD PARTING AGENTS AND OTHER SUBSTANCES

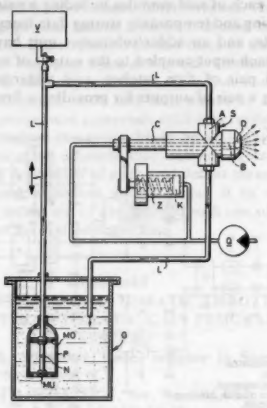
Bruno Bachofen, Wettswil, and Karl Riedl, Arni-Islisberg, both of Switzerland, assignors to Siemens-Albis Aktiengesellschaft, Zurich, Switzerland

Filed Feb. 10, 1975, Ser. No. 548,465
Claims priority, application Switzerland, Feb. 15, 1974, 2091/74
Int. Cl.² B05B *9/00, 7/12*; F04B *49/00*
U.S. Cl. 239—124 **12 Claims**

1. Apparatus for spraying a sprayable substance, comprising in combination:

means including a conduit for circulating said substance; and

means including a first bore connected in said conduit for a circulation of said substance through said bore, a spraying device, a second bore intersecting said first bore at an angle and extending to said spraying device, and means for supplying a pressurized medium to said spraying device, including a nozzle pin extending in said second bore and having a third bore for supplying said pressurized medium to said nozzle device, and means for regulating the supply of said circulated substance from said first bore to said spraying device, including means connected

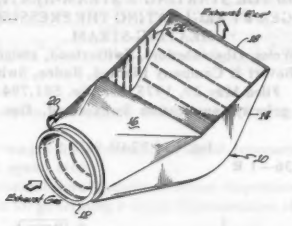


to said nozzle pin for varying the position of said nozzle pin in said second bore.

3,981,448
COOLED INFRARED SUPPRESSOR

Christos Demogenes, Pacific Palisades, Calif., and Robert A. Stone, Arlington, Va., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Apr. 23, 1970, Ser. No. 31,108
Int. Cl.² B64D *33/04*
U.S. Cl. 239—127.3 **27 Claims**



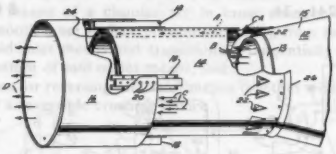
1. An infrared suppressor for the exhaust of an infrared radiation source comprising a generally scoop-shaped duct having an annular inlet to receive the exhaust from the infrared radiation source and a generally flattened outlet to discharge the infrared suppressed exhaust from said duct, said outlet directed off to one side from said inlet to prevent the direct viewing of the radiation source from said outlet, said duct including means to cool the exhaust between said inlet and said outlet comprising a heat transfer matrix including a pair of spaced plates separated by a plurality of transverse spacer elements to form a plurality of separate transversely extending compartments, the surface of one of said pair of heat transfer matrix plates exposed to the exhaust and having a plurality of openings therein with each separate compartment having at least one opening to discharge coolant therefrom into the exhaust and an outer shroud plate disposed around and spaced apart from the other of said pair of spaced heat transfer matrix plates form a coolant header around said heat transfer matrix to receive and distribute a coolant to the separate compartments of said heat transfer matrix, the other of said heat transfer matrix plates having a plurality of openings therein with each separate compartment having at least one opening to receive coolant from said coolant header.

3,981,449

EXHAUST COOLING SYSTEM

John F. Krey, North Hollywood; Ephraim Regelson, China Lake, and John D. Crecelius, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 29, 1968, Ser. No. 703,230
Int. Cl.² B64D 33/04
U.S. Cl. 239—127.3 1 Claim



1. An exhaust cooling system attachment for combustion engines having an exhaust tail pipe and a shroud surrounding said pipe; said attachment comprising:

inner and outer cylindrical wall members forming a dual walled conduit having a longitudinal dimension and a radial dimension;

a cylindrical shield having a diametral dimension larger than the diametral dimension of the outer wall member of said dual walled conduit and fastened to said outer member in overlapping spaced relationship;

said walls of said dual walled conduit forming an inner and an outer passageway;

said dual walled conduit having a plurality of openings in the outer wall thereof to admit cooling air to the forward end of said outer passageway;

said outer wall attached to said shroud of said engine exhaust system and said inner wall attached to said outer wall near said pipe, whereby exhaust gases flow through the inner passageway;

said radial dimension of said inner member being substantially constant and commensurate with the terminus of said tail pipe;

the radial dimension of said outer member being substantially commensurate with the terminus of said shroud; and

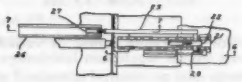
said shield overlapping said conduit from a point rearward of the mean of said longitudinal dimension and extending beyond the terminus of said conduit a distance approximately equal to the overlapping portion so that cooling air will flow between said shield and said tube to provide further cooling of said exhaust gases.

3,981,450

IN-FLIGHT MODULATING THRUST REVERSER

Arthur McCardle, Jr., Greenhills; George H. Israel, Jr., Cincinnati; Frank J. Trombetta, West Chester, and David F. Howard, Madeira, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 22, 1975, Ser. No. 615,757
Int. Cl.² B64C 15/06
U.S. Cl. 239—265.31 10 Claims



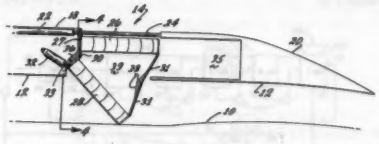
1. In a combined translating flap convergent/divergent variable area-aircraft engine-exhaust nozzle and integrated thrust reverser mechanism; an exhaust duct having an outer, stationary shroud portion; a thrust reverser-set of cascades mounted to said shroud portion; a first, inner, exhaust duct-stationary segment; a second, inner, exhaust duct-translating segment disposed in a normally closed relation to said first, exhaust duct-stationary segment when the engine exhaust is being ejected in an aft direction during the forward thrust regimen to thereby close off the reverse thrust-exhaust flow path through said cascades; a variable throat area-exhaust nozzle receiving and discharging the engine exhaust being ejected in the said aft direction; an outer cowl member normally covering said cascades during the forward thrust regimen; first, exhaust nozzle-hydraulic actuator means operative to generally open and close the exhaust nozzle to thereby vary its throat area during different forward thrust-flight regimes; first, thrust reverser-actuating means interconnected with and operable to simultaneously adjust both of the said second, exhaust duct-translating segment and said outer cowl member to their open positions to thereby open the reverse thrust-exhaust flow path through said cascades; separate, exhaust flow-controlling means positioned at the aft end of said exhaust nozzle and selectively operable to open and close the forward thrust-exhaust flow path through said exhaust nozzle; second, thrust reverser-actuating means interconnected between said first, thrust reverser-actuating means and said separate, exhaust flow-controlling means and automatically effective by the operation of said first-named, actuating means to actuate said separate, exhaust flow-controlling means to its closed position to thereby shut off the engine exhaust flow in an aft direction through said exhaust nozzle when the reverse thrust regime is in operation; and second, thrust reverser-hydraulic actuator means interconnected with and operable to adjust said first, thrust reverser-actuating means to the thrust reverser regime and thereby move both of the said second, exhaust duct-translating segment and said outer cowl member to their opened positions to thus open the reverse thrust-exhaust flow path through said cascades.

3,981,451

FAN CASCADE THRUST REVERSER

Barry W. Prior, San Diego, and John T. Halkola, La Jolla, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Nov. 17, 1975, Ser. No. 632,182
Int. Cl.² F02K 3/06; B64C 15/04
U.S. Cl. 239—265.31 5 Claims



1. A thrust reverser for a turbo-fan engine comprising:

a split shroud having two longitudinal sections surrounding said engine and forming a duct therebetween, the forward section of said shroud being fixedly positioned and the rear section of said shroud being translatable, said rear section forms a continuation of the aerodynamic contour of said forward section when stowed and provides an opening between said sections when deployed rearward, said duct communicates exterior of said shroud through said opening;

a plurality of first and second cascade baskets, said first cascade baskets fixedly attached to said forward section and each of said second cascades pivotally attached to said forward section at one of its ends and at its other end is attached through a hinge member to one of said first cascade baskets, one of each of said first and second cascades have a juxtaposed relationship when said second cascades are in a stowed position and nest within a cavity

formed in the forward portion of said rear section and said second cascades pivot downward toward said duct in their deployed position for directing the fan gases through said first cascades external of said shroud in a direction substantially reverse to the normal rearward flow through said duct, said hinge means blocks the rearward flow path of said fan gases when said second cascades are deployed; and

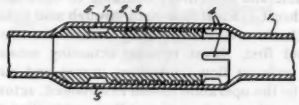
a plurality of linear actuator members for translating said rear section and rotating said second cascade baskets.

3,981,452

IRRIGATION PIPES WITH DRIPPER UNITS AND METHOD OF ITS MANUFACTURE

Gershon Eckstein, 9 Naomi St., Har Hacarmel, Haifa, Israel

Filed Feb. 10, 1975, Ser. No. 548,736
Int. Cl.² B05B *15/00*
U.S. Cl. 239—542 **7 Claims**



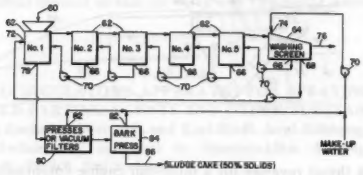
1. A continuous irrigation pipe with integrally built-in dripper units spaced at predetermined intervals having an aperture in alignment with each of said units, said dripper units having an inlet and an outlet, the inlet being in communication with the interior of the pipe and the outlet being in communication with the aperture and the exterior of the pipe.

3,981,453

METHOD FOR SEGREGATING BARK AND FOLIAGE FROM WOOD CHIPS AND TWIGS

Robin Wilfrid Berlyn, Montreal, and James David Hutchinson, Dorval, both of Canada, assignors to Pulp and Paper Research Institute of Canada, Canada

Filed Nov. 29, 1974, Ser. No. 528,479
Claims priority, application Canada, Nov. 29, 1973, 186975
Int. Cl.² B02C *23/38*
U.S. Cl. 241—21 **17 Claims**



1. A method for detaching bonded bark, and foliage, if present, from wood chips and twigs in a mixture of such components and selectively comminuting and segregating the bark and foliage from said mixture, comprising:

a. storing said mixture in a pile for a sufficient time to effect partial decomposition of the bark and foliage of the mixture to the extent of weakening the bond between the bark and the wood, and the structure within the bark itself;

b. subjecting resultant partially decomposed mixture to vigorous agitation in admixture with sufficient quantity of added water to form a slurry and to allow the mixture to circulate, said vigorous agitation being for a sufficient time to break the bark from the wood chips and twigs and to comminute the bark and foliage to a lower particle size than the wood chips; and

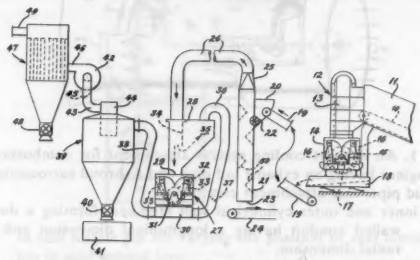
c. wet screening the comminuted bark, foliage, and effluent water from the wood chips and twigs of the agitated mixture.

3,981,454

WASTE MATERIAL PROCESSING APPARATUS

Robert M. Williams, Ladue, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

Filed July 7, 1975, Ser. No. 593,625
Int. Cl.² B02C *23/10*
U.S. Cl. 241—24 **8 Claims**



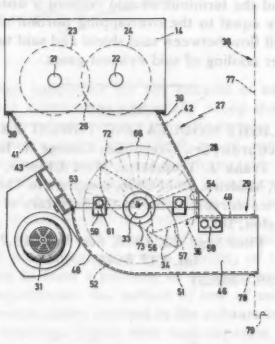
7. In waste material processing the method which comprises the steps of shredding the waste material in a first stage mill, subjecting the output from the first stage mill to an air separation step in which light weight air borne fractions are separated from heavier weight fractions, processing the air borne fractions in a second stage mill, maintaining the second stage mill under a negative pressure, maintaining air flow from the air separation step through the second stage mill, and extracting the light weight fractions from the air flow beyond the second stage mill.

3,981,455

DEVICE FOR PROCESSING REFUSE

Al Kaczmarek, 2010 Warrenville Road, Lisle, Ill. 60532

Filed Nov. 29, 1974, Ser. No. 527,942
Int. Cl.² B02C *13/09*
U.S. Cl. 241—32 **19 Claims**



1. A device for processing refuse of varied composition comprising,

inlet means,

rotatable shaft means spaced from said inlet means,

means for driving said shaft means with high moment and at low speed,

a plurality of elongated, bend-resistant plate means rigidly secured to and extending from said shaft means,

said plate means being slightly shorter than the depth of said inlet means at the level of said shaft means and being spaced a short distance from one another,

means for reversing the rotation of said shaft means in response to overload,

outlet means having a bottom at a level below said shaft means and adapted to be connected to back pressure means,

a plurality of fixed stripper finger means protruding towards said shaft means and extending, between said plate means from the rear area of said outlet means,

wall means of a circular arc in cross section, having a smooth inner surface portion emanating from the rear of said inlet means and transitioning tangentially into the bottom of said outlet means, and

means for reversing said shaft means together with reversal of a reversible crushing device.

3,981,456

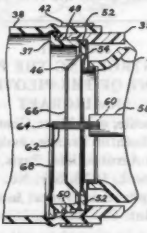
FOOD PARTICLE MACERATING MEANS

Thomas M. Hahn, Louisville, and George T. Sholtes, Fern Creek, both of Ky., assignors to General Electric Company, Louisville, Ky.

Filed Oct. 31, 1975, Ser. No. 627,603

Int. Cl.² B02C *13/10;* **F04D** *29/70*

U.S. Cl. 241—46 R **3 Claims**



1. A pump and motor assembly for use with a dishwasher comprising a pump housing having an inlet and an outlet, a rotatable shaft having an impeller for rotation within said housing at a preselected location to provide for pumping of fluid from said inlet toward said outlet;

a grid-like food particle grading element disposed across said inlet and having a plurality of openings through which fluid entering said inlet must pass to reach said impeller;

a food particle cutter attached to said shaft and including a cutting arm mounted on a flexible, helically-wound column, said arm being rotatable about said axis and said column being flexibly expandable to provide for said arm to pass over an unmacerable food particle lodged in one of said openings of said grading element.

3,981,457

PLASTIC COMMINUTING METHOD AND APPARATUS

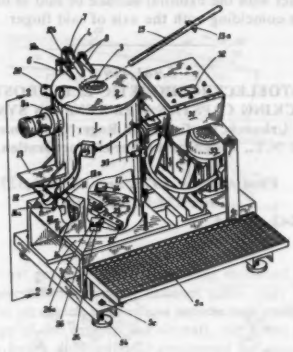
Herman C. Weist, Louisville, Ky., assignor to Weist Industries, Inc., Louisville, Ky.

Filed Dec. 24, 1974, Ser. No. 536,154

Int. Cl.² B02C *23/36*

U.S. Cl. 241—46.17 **1 Claim**

1. An apparatus for communiting a plastic material including: generally cylindrical receptacle means having a vertical axis, a generally horizontal bottom, an inlet opening to receive selected plastic, and outlet opening means located in the bottom portion of said receptacle for emission of comminuted plastic material; lid means to selectively close said inlet; outlet cover means to selectively cover said outlet means; rotatable cutter blade means adapted for rotation about an axis generally parallel to said vertical axis and in a generally horizontal plane within said receptacle and in spaced relation from said receptacle bottom; fixed cutter blade means carried on the periphery of said receptacle means in spaced relation from said rotating cutter blade means; fluid supply means selectively inject a selected fluid into said receptacle means; a generally vertical rotatable shaft means carrying said rotatable



cutter blade means; bearing means located beneath and adjacent said receptable bottom to receive said shaft means for rotation therein, and bearing cooling means to receive heat from said bearing means, where said bearing cooling means includes means to receive said fluid to be admitted to said receptacle in heat transfer relation prior to supplying said fluid to said receptacle means.

3,981,458

SINGLE PIN GUIDE TRAVERSE

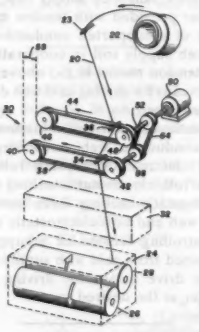
Lawrence W. Rogers, Brewton, Ala., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 236,535, March 8, 1972, abandoned. This application Nov. 7, 1974, Ser. No. 521,600

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² B65H *54/30*

U.S. Cl. 242—43 R **6 Claims**



1. In apparatus wherein yarn is fed from a yarn source to a yarn winding means rotating about an axis, yarn traversing means for traversing said yarn in a plane generally parallel to said axis, said traversing means comprising:

a. a yarn-engaging finger extending through said plane;

b. support means supporting said finger for movement in a closed path in said plane and between said yarn source

and said yarn winding means, said path including first and second generally parallel straight segments connected by first and second arcuate end segments, said first and said second segments being generally parallel to said axis, the only contact between said yarn and an element supported by said support means being contact between said yarn and said finger;

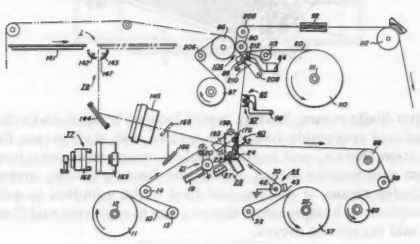
c. and guide means for maintaining said yarn in continuous contact with the external surface of said at one side of a plane coinciding with the axis of said finger.

3,981,459

PHOTOELECTROPHORETIC ELECTROSTATIC TACKING CAPSTAN WEB TENSION SYSTEM

Edwin A. Urbanek, Penfield, and Roger G. Teumer, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 24, 1975, Ser. No. 571,327
Int. Cl.² B65H *59/00*
U.S. Cl. 242—75.44 **4 Claims**



1. A web tension system comprising in combination:

a. a web supply roll mounted to support a conductive web for travel, said web supply roll provided with tension means for controlling web tension of a supported conductive web unwinding from said web supply roll;

b. a web drive capstan roller for driving a supported conductive web through friction contact therewith at constant velocity;

c. a web friction capstan roller mounted in the direction of web travel after said web supply roll, said web friction capstan roller provided with tension means for controlling tension of a supported conductive web unwinding from said web supply roll in cooperation with said web supply roll tension means in (a) above;

d. main drive means for driving said web drive capstan roller at the desired speed;

e. an electrostatic capstan roller mounted to transport a supported conductive web unwinding from said web supply said electrostatic capstan roller provided with electrostatic roll, electrostatic tacking means for providing an electrostatic tacking force between a supported conductive web and said electrostatic capstan roller and thereby controlling tension of a supported conductive web transported from said web supply roll; and

f. electrostatic drive means for driving said electrostatic capstan roller at the desired speed.

3,981,460

STAGGERED CHANNEL WING-TYPE AIRCRAFT

Alexander Ratony, Simi Valley, Calif., assignor to Robert N. Starr, North Hollywood, Calif.

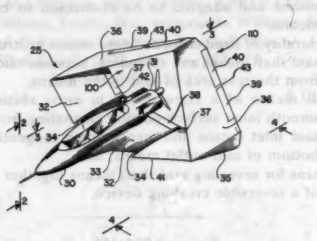
Filed Aug. 30, 1973, Ser. No. 393,220
Int. Cl.² B64C *3/06*
U.S. Cl. 244—13 **3 Claims**

1. A staggered channel wing type aircraft comprising:

a fuselage with a nose and a passenger section;

a pusher type propulsion means mounted behind said passenger section, said fuselage being free of any tail structure;

a lower pair of wings swept rearward from said fuselage;



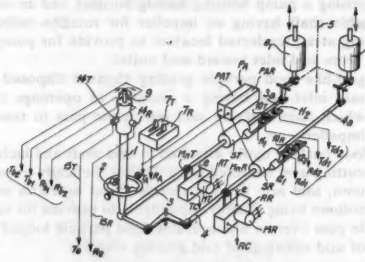
an upper pair of wings rigidly attached at the wing tips of said lower pair and swept back, inward and upward from said tips and secured together to form a triangular pyramid-like configuration with the upper wings being free from the fuselage and from vertical fins and both upper and lower wings having control surfaces thereon for controlling the aircraft about the roll, pitch and yaw axes.

3,981,461

SYSTEM FOR CONTROLLING THE POSITION OF THE ANCHORAGE POINT OF THE PILOTING CHANNEL OF AN AIRCRAFT

Gérard Fleury, Marseille, and Marc Camille Alexandre Fourcade, St-Victoret, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed June 2, 1975, Ser. No. 582,674
Claims priority, application France, June 6, 1974, 74.19532
Int. Cl.² B64C *27/70*
U.S. Cl. 244—17.13 **4 Claims**



1. A System for controlling the position of at least one anchorage point of an aircraft piloting channel, with a manual control, a servo control, a moving element inserted as an anchorage point between said manual control and said servo control, and a trim motor for positionally controlling said moving element, said position controlling system comprising an electronic switch having main electrodes inserted in the supply circuit of said trim motor and a control electrode, and a first and a second logic arrangement connected for processing the manual and automatic data coming from the piloting channel, said first logic arrangement being operative to energise the main electrodes of the said switch for having said trim motor running in a particular direction, and said second logic arrangement being operative to energise the control electrode of the said switch.

3,981,462

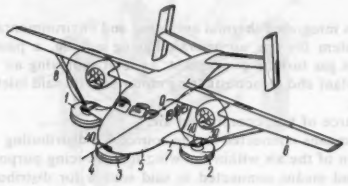
AIR-CUSHION LANDING GEAR FOR AIRCRAFT

Igor Alexandrovich Berezhnoi, ulitsa Tukhachevskogo, 253, kv. 18; Albert Ivanovich Elatontsev, ulitsa Sovetskoi Armii, 163, kv. 61; Vladimir Vasilievich Ignatiev, prospekt Kirova, 293, kv. 40, all of Kuibyshev; Djuis Danilovich Ivlev, prospekt Mira, 184, kv. 2, Moscow; Boris Veniaminovich Mayanov, ulitsa Gagarina, 27, kv. 2, Kuibyshev; Vasily Andriyanovich Svinukhov, ulitsa Fizkulturnaya, 98a kv. 2, Kuibyshev; Vladimir Petrovich Kuzmin, ulitsa Sovetskoi Armii, 200, kv. 16, Kuibyshev; Igor Alexandrovich Evdokimov, prospekt Kirova, 212, kv. 39, Kuibyshev, all of U.S.S.R., and Boris Alexeevich Zhidkov, deceased, late of Kostromskoi Pereulok, 8, kv. 26, Kuibyshev, U.S.S.R. (by Ljudmila Vasilievna Zhidkova, administratrix)

Continuation of Ser. No. 493,732, July 31, 1974, abandoned. This application May 15, 1975, Ser. No. 577,781

Int. Cl.[2] B64C *25/54*

U.S. Cl. 244—100 A 13 Claims



1. An aircraft air-cushion landing gear comprising: landing gear units suspended from said aircraft; at least two of said landing gear units being spaced transversely with respect to the longitudinal axis of said aircraft; at least one of said landing gear units being arranged on the longitudinal axis of said aircraft ahead of its center of gravity; each of said landing gear units being suspended from said aircraft by a separate platform; each of said landing gear units having at least one inflatable cell secured to the underside of said platform; each of said inflatable cells of said landing gear units being of a generally annular configuration in plan and, when inflated, circumscribing an air-cushion space under said platform; injecting devices built in the platforms of said landing gear units; each of said injecting devices supplying compressed air to the inner cavity of one of said inflatable cells for inflating it and to said air-cushion space circumscribed thereby for providing a lift force which sustains the aircraft in close proximity to the runway surface during take-off, landing and taxiing; means for decelerating and controlling the aircraft's movement, provided in at least two of said spaced-apart landing gear units, the platform of each said landing gear unit and the inflatable cell secured thereto being of a generally annular configuration in plan and arranged coaxially, and the injecting device comprises a centrifugal fan whose impeller is disposed under the platform in the upper portion of the air-cushion space circumscribed by the inflatable cell, on its axis, and, to supply compressed air to said impeller, the platform has a through channel, while, for inflating the cell, its inner cavity is coupled to branch pipes whose intake ends are arranged in the direction of the air flow repulsed by the impeller of the fan, the inflatable cell being confined, when inflated, by a cylindrical wall from the outside, whose diameter is equal to that of the platform, and by a truncated conical wall with a larger lower base from the inside, on the side of the air-cushion space, flexible annular membranes being provided inside the inflatable cell, stiffening its side wall and having openings for the passage of air, flexible and stiffening elements being attached to the inner and outer walls of the inflatable cell to facilitate the folding of the cell after it has been deflated to be retracted and pressed against the platform, and elastic cords comprising the flexible elements attached to the walls of the cell in a prestretched condition.

3,981,463

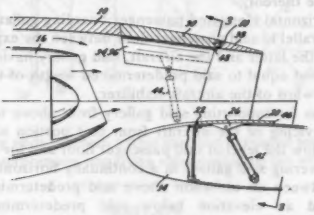
OVERWING THRUST REVERSER

Ladislao Pazmany, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Continuation of Ser. No. 453,377, March 21, 1974, abandoned. This application Mar. 27, 1975, Ser. No. 562,532

Int. Cl.[2] B64D *33/04*; F02K *1/12*

U.S. Cl. 244—110 B 4 Claims



1. In a trust reverser utilized on wing mounted jet engine powered aircraft discharging exhaust gases over the wings thereof, said jet engine housed in a nacelle being affixed to the leading edge of the wing of the aircraft, the lower portion of the nacelle being appropriately contoured for connection to said wing such that the outer skin on said lower portion forms a continuous aerodynamic profile with said wing, said reverser comprising a blocker door which in stowed position overlies the upper surface of said wing and is similarly profiled, said blocker door being pivotable counterclockwise from a fixed pivot point at its leading edge to its deployed condition wherein it intercepts the exhaust gases prior to said gases being discharged through the nozzle of said nacelle, a deflector door having a fixed pivot point at its trailing edge is formed in the nacelle between the aft portion of said engine and the nozzle of said nacelle in the vicinity of the trailing edge of said nacelle, and which in stowed position forms part of the interior and exterior contour of said nacelle, said deflector door being pivotable clockwise to a deployed position in which it intercepts the exhaust gases delivered thereto by said blocker door and diverts them forwardly, a first actuator means positioned within walls of said nacelle pivotally connected between said nacelle and active on said deflector door to deploy and stow said defector door, and second actuator means positioned within said wing structure and pivotally connected and active on said blocker door at its other end to deploy and stow said blocker door.

3,981,464

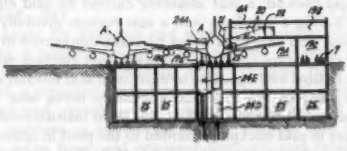
AIRPORT TERMINAL

Robert E. Dudley, Bellevue, Wash., assignor to Richard M. Tracey and Gerald R. Brunstrom, both of Seattle, Wash., part interest to each

Division of Ser. No. 852,969, Aug. 18, 1969, Pat. No. 3,554,470, which is a continuation of Ser. No. 645,213, June 12, 1967, abandoned. This application Aug. 6, 1970, Ser. No. 61,675

Int. Cl.[2] B64F *1/36*

U.S. Cl. 244—114 R 8 Claims



4. A passenger embarking and debarking facility for aircraft having wing-tips of a predetermined height and a fuselage of

a predetermined length from the front of the aircraft to a point adjacent to the stabilizer of the aircraft, comprising:

a building having a passenger floor disposed at an elevation which is above said predetermined height, said building being open along at least a portion of one side so as to expose an edge of said passenger floor and so that one wing of the aircraft may be received within the building below said passenger floor thereby permitting the aircraft to be parked alongside the building and parallel to the side thereof;

a horizontal elongated passenger boarding gallery disposed parallel to said passenger floor between the exposed edge of the latter and the aircraft, said gallery having a length about equal to said predetermined length of the aircraft forward of the aircraft stabilizer;

means for supporting said gallery from above to facilitate servicing of the aircraft from that portion of the edge below the level of said passenger floor and for raising and lowering said gallery in a continually horizontal position between an elevation above said predetermined height and an elevation below said predetermined height whereby said gallery may be raised to permit entry of one wing of the aircraft into the building and subsequently lowered to a position opposite one side of the aircraft fuselage for permitting movement of passengers between said gallery and the aircraft; and

an adjustable passenger access ramp extending between said passenger floor of the building and said gallery.

3,981,465

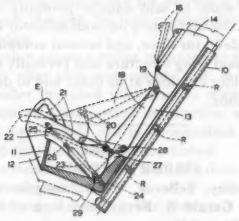
SUPINATING SEAT AND CONTROL DISPLAY FOR AIRCRAFT COCKPITS

James M. Sinnett, St. Louis; Leslie N. Edgington, Florissant, and Carl F. Asiala, Hazelwood, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed May 5, 1975, Ser. No. 575,047

Int. Cl.² B64D *11/06*

U.S. Cl. 244—122 A **14 Claims**



13. In an aircraft: a cockpit; and pilot accommodations in said cockpit which comprise, an ejection rail and rail support in said cockpit, a seat assembly carried by said ejection rail and having a seat back and a seat bottom pivotally interconnected, said seat back being pivotally connected to said ejection rail, means connected between said ejection rail and said seat bottom and operable to move said seat bottom away from said ejection rail and simultaneously move said seat back about its pivotal connection; and flight instrumentation panel means in said cockpit presented to the pilot in spaced relation from said seat assembly, said seat bottom movement away from said ejection rail supinating the pilot relative to said flight instrumentation panel means.

3,981,466

INTEGRATED THERMAL ANTI-ICING AND ENVIRONMENTAL CONTROL SYSTEM

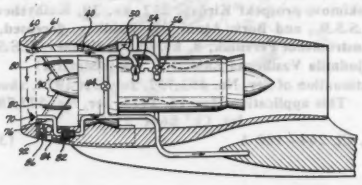
Anil D. Shah, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 23, 1974, Ser. No. 535,928

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² B64D *15/02, 13/08*

U.S. Cl. 244—134 R **3 Claims**



1. An integrated thermal anti-icing and environmental control system for use on aircraft having a wing, a passenger cabin, a gas turbine powerplant, an inlet supplying air to the powerplant and an acoustic ring mounted with said inlet comprising:

a source of hot, compressed air;

first means connected to the source for distributing a portion of the air within the wing for anti-icing purposes;

second means connected to said source for distributing a second portion of the air within the inlet for anti-icing purposes and for cooling that portion of the air to a predetermined maximum temperature;

a heat exchanger connected to the second means;

a liquid;

closed-loop means for circulating the liquid through the heat exchanger and the acoustic ring;

environmental control means connected to said heat exchanger for conditioning and pressurizing air for the passenger cabin.

3,981,467

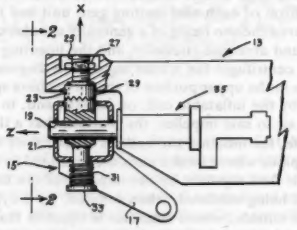
LAUNCH LOCK DEVICE

Kenneth G. Ludlow, Manhattan Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 17, 1975, Ser. No. 623,530

Int. Cl.² B64G *1/00*

U.S. Cl. 244—158 **3 Claims**



1. A launch lock device for locking the rotatable structure and the despun structural platform of a dual spin spacecraft in each of three axes during the launch phase, said device comprising a slidable pin disposed for lateral movement into and out of said despun structural platform, a tubular channel element having aligned openings in the sidewall thereof attached to said rotatable structure, said pin being positioned to pass through the aligned openings in said channel element, a

two-piece upright member positioned within said channel element and passing through the upper and lower walls thereof, said upright member having an opening therethrough in alignment with the openings in the sidewall of said channel element, said pin passing through the opening in said upright member, means for preventing lateral movement of said rotatable structure relative to said despun structural platform during the launch phase of said spacecraft, and means for releasing said rotatable structure from said despun platform after a predetermined flight distance prior to orbit of said spacecraft thereby allowing free rotation of said rotatable structure.

3,981,468

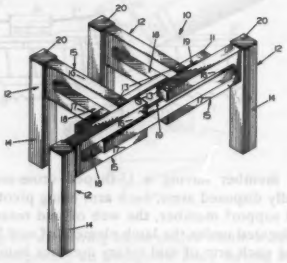
STAND

Leif A. Holan, Chimney Rock, Winona, Minn. 55987

Filed May 12, 1975, Ser. No. 576,353

Int. Cl.² F16M *1/38*

U.S. Cl. 248—167 **3 Claims**



1. A stand comprising,

a centrally disposed body member,

a plurality of leg members, at least one of said leg members having an upright portion one end of which is adapted to engage a base surface and having spaced apart fingers extending at substantially right angles to the upright portion, said spaced apart fingers defining an unobstructed opening therebetween and straddling said body member with a finger on opposed sides of said body member,

means connecting a leg member having the spaced apart fingers to said body member, said means allowing said leg member to be adjusted pivotally about an axis and also allowing said axis to be moved to different positions with respect to said body member while retaining the upright portion of said leg member in an upright position, said axis being parallel to said upright portion of said leg and

means for locking said axis and its associated leg at various positions relative to the body member.

3,981,469

HANGER FOR SUSPENDED CONCRETE FORMS

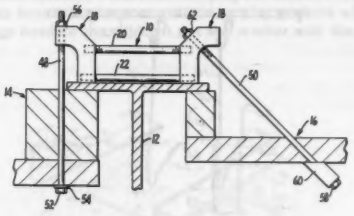
Philip A. Torbet, San Mateo, and Cyril Thomas Eager, San Francisco, both of Calif., assignors to The Burke Company, San Mateo, Calif.

Filed Nov. 6, 1975, Ser. No. 629,121

Int. Cl.³ E04B *1/00*; E04G *17/16*

U.S. Cl. 248—235 **6 Claims**

1. A hanger for suspending concrete forms, said hanger comprising: a pair of ends disposed in spaced relationship to one another, said respective ends having opposed screw threaded openings in the upper portions thereof and opposed non-threaded sockets in the lower portions thereof, and each said end also having a suspension rod opening for the receipt and support of a suspension rod and an undersurface adapted to rest upon a member upon which the hanger is supported; a tension rod extending between said ends, said rod having screw threaded portions threadably engaged with the opposed threaded openings in said ends; and, a compression strut extending between said ends beneath said tension rod, said



strut having ends received within said non-threaded sockets in abutting compression imparting relationship to the ends.

3,981,470

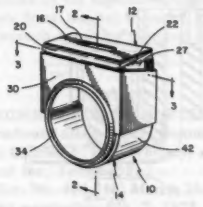
MOLDED PLASTIC ADJUSTABLE INSTRUMENT PANEL

Renzo N. Rutili, 1515 Madison St., Evanston, Ill. 60202, and Howard J. Rasmussen, 1634 Meade Ave., Chicago, Ill. 60639

Filed Mar. 13, 1975, Ser. No. 557,939

Int. Cl.³ A47H *1/10*; A47F *5/00*

U.S. Cl. 248—291 **4 Claims**



1. An instrument panel, comprising; a mounting bracket adapted to be fixed to a surface of random orientation, a mounting panel pivotally connected to said mounting bracket, said mounting panel having an opening therethrough for receiving an instrument, integral hinge means interconnecting said mounting bracket and said mounting panel, means for locking said mounting panel at a predetermined angular orientation with respect to said mounting bracket including means on said mounting panel having at least one tooth integrally molded therewith, a projection integrally molded with said mounting bracket and having a plurality of serrations thereon, said projection including at least one post having said serrations thereon, and said mounting panel having a circular aperture thereon defining said one tooth and receiving said post.

3,981,471

HANGER DEVICE

Robert F. Currier, 4129 Horton Road, Jackson, Mich. 49201

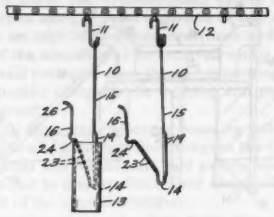
Filed Aug. 20, 1975, Ser. No. 606,307

Int. Cl.² A47J *51/142*; A47F *5/00*; A47J *5/00*

U.S. Cl. 248—317 **5 Claims**

1. A hanger for engaging and supporting tubular objects comprising a resilient, single piece member defining a U-shaped closed end and opposing arms extending from said closed end, a retaining portion on each of said arms adjacent said closed end, retaining teeth defined along each of said retaining portions, a handle portion on each of said arms extending away from said retaining portions, said retaining portions extending from said closed end in a diverging, non-parallel relationship, whereby said closed end is placed within

the tubular object by gripping said handle portions and compressing said arms and whereby both handle portions remain



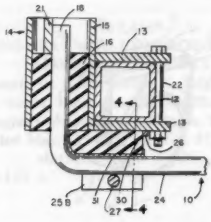
exterior of the tubular object upon release of said handle portions.

3,981,472

CUSHION CLAMP FOR SPRING SHANKS OF EARTH WORKING TOOLS

Robert D. Anderson, Murdock, Minn., assignor to TCI, Inc., Benson, Minn.

Filed Jan. 24, 1975, Ser. No. 543,816
Int. Cl.² F16F *15/04*
U.S. Cl. 248—358 R **8 Claims**



1. A clamp assembly for mounting a spring shank onto a support frame member, including a main support means, means to fix the main support means to a support frame member, a spring shank having an attachment portion comprising a first finger bent integral with said shank and at substantially right angles to an adjacent portion of the shank, said adjacent portion being positioned generally horizontal during use, and means connected between said first finger and said main support means comprising a resilient elastomeric sleeve and a housing holding said sleeve, and a separate elastomeric block mounted on said main support means and positioned between said main support means and the adjacent generally horizontal portion of said shank, said finger being mounted in said sleeve and transferring loads on said spring shank to said elastomeric sleeve, and through said housing to said main support means and said adjacent generally horizontal portion bearing against said elastomeric block during use of said spring shank to transfer loads from the horizontal portion of the spring shank to the main support means.

3,981,473

LOCKING DEVICE FOR ADJUSTABLE SEAT TRACK STRUCTURE

Tsuyoshi Nagai, Toyota, Japan, assignor to Arakawashatai Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 9, 1975, Ser. No. 575,990
Claims priority, application Japan, Jan. 28, 1975, 50-11553
Int. Cl.² F16M *13/00*
U.S. Cl. 248—430 **5 Claims**

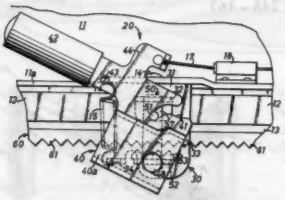
1. A locking device, for an adjustable seat track structure: comprising an elongated stationary track for securement on the floor of a vehicle compartment, a movable track slidably mounted on the stationary track along the longitudinal direction thereof to be locked in a selected position;

an elongated, continuously toothed, lock plate secured to and under said stationary track;

a support member secured on said movable track and including a pair of legs straddling both sides of said stationary track;

a latch member of U-shaped cross-section having its web under said stationary track and its upwardly directed arms slidably guided by said support member for up and down movements toward and away from said lock plate, said latch member being provided with a latch element located under said lock plate to be engaged with a selected portion of the continuous teeth on the lock plate;

an outwardly directed pin secured to each arm of said latch member;



a rotary member having a U-shaped cross-section with upwardly disposed arms, each arm being pivoted to a leg of said support member, the web of said rotary member being located under the latch element of said latch member and each arm of said rotary member being provided with a cam slot engaged with one of said pins of said latch member, said cam slots each including a supporting cam face to support one of said pins thereon and an arcuate cam face to permit upward and downward movement of said pin upon rotary movement of said rotary member;

an operation handle on said rotary member for manual actuation to rotate the rotary member; and

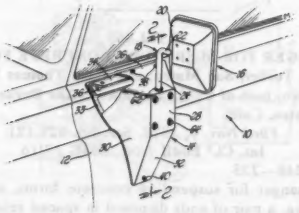
resilient means for biasing said rotary member to maintain the engagement of said latch element with said continuous teeth on the lock plate.

3,981,474

MIRROR BRACKET ASSEMBLY

Jane M. Szilagyi, Center Valley, Pa., assignor to Delbar Products, Inc., Perkasie, Pa.

Filed June 12, 1975, Ser. No. 586,335
Int. Cl.² A47G *1/24*
U.S. Cl. 248—487 **6 Claims**



1. An outside rear view mirror assembly adapted to be mounted to a body portion of a vehicle, said assembly comprising a mirror head, a support arm including first and second leg portions, and means for adjustably mounting the mirror head upon said first leg portion, a monolithic housing structure integrally associated with said vehicle body portion and projecting exteriorly therefrom, said housing structure includ-

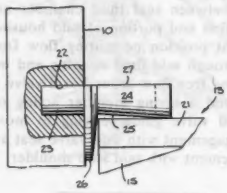
ing a laterally projecting wall portion and a vertically extending wall portion depending therefrom, first and second coacting journal bearing members mounted on said vertical wall portion internally of the housing structure, an opening in said laterally projecting wall portion and axially aligned with said journal bearing members, the second leg portion of said support arm projecting through said wall opening and clampingly supported between said journal members, and means for adjusting the clamping pressure between said journal members and said second leg portion.

3,981,475

SHELF ANCHORING CLIP

Kenneth D. Weeks, Valdese, and Ronald W. Scoggin, Morganton, both of N.C., assignors to Champion International Corporation, Stamford, Conn.

Filed Feb. 21, 1975, Ser. No. 551,661
Int. Cl.² F16M *1/00*
U.S. Cl. 248—500 **4 Claims**



1. A clip for anchoring loose shelvs within a cabinet during shipping comprising an elongated body having at one end a cylindrical portion for insertion in a bore in a side panel of the cabinet, at the other end a camming portion with a surface on its side for exerting pressure against the adjacent surface of a stacked assembly of said shelves, and a segment of an annular flange disposed intermediate said ends of said body in a plane substantially normal to the longitudinal axis of said body for disposition between said side panel and an end of at least one shelf, said camming portion and said flange having a common substantially flat side substantially co-planar with an element of said cylindrical portion, said side surface of said camming portion being flattened and disposed opposite said flat side but, at least at its extremity, radially more distant from the central axis of said cylindrical portion than said flat side, and wherein said camming portion has rounded surface portions between said flat side and said flattened surface.

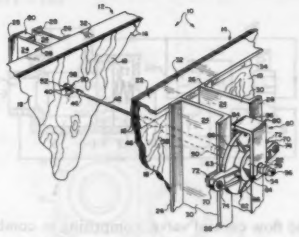
3,981,476

SPREADER CLIP ASSEMBLY FOR A CONCRETE WALL FORM

Kenneth B. Alexander, and Robert J. Flathau, both of Elgin, Ill., assignors to Symons Corporation, Des Plaines, Ill.

Filed Feb. 6, 1975, Ser. No. 547,759
Int. Cl.² E04G *17/08*
U.S. Cl. 249—42 **7 Claims**

1. In a concrete wall form of the type wherein opposed form sides, each consisting of panel units disposed in edge-to-edge relationship, are reinforced by outside, spaced apart, vertical strongbacks, wherein adjacent strongbacks on each form side are bridged and connected by reaction washers through which tie rod-connected she-bolts having externally threaded outer end regions loosely project, wherein fastening nuts are threadedly received on the outer threaded ends of the she-bolts so as to resist the outward spreading action of the washers incident to the outward thrust of wet concrete which is poured between the form sides, and wherein means are provided on said washers for releasably clamping said washers to their respective pairs of strongbacks, the improvement which comprises: a clip member of inverted J-shape configuration having a relatively short inner leg and a relatively long outer leg connected together at their upper ends by a bight portion associated with each she-bolt, and means captively and pivotally connecting said clip member at the inner leg thereof to the associated reaction washer for swinging movement of the clip member between a lowered vertical locking position wherein said legs straddle the adjacent nut and washer with the outer



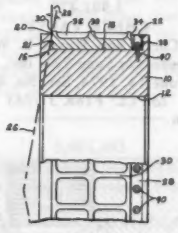
leg opposing the outer face of the nut, captively locating said nut between said washer and the inner face of the outer leg, and an out-of-the-way raised upwardly inclined position wherein a major portion of the clip member is disposed between and straddled by the adjacent strongbacks and the outer leg is withdrawn from the nut in order to render the latter accessible for wrench-receiving purposes.

3,981,477

DIE SEGMENT FOR BRIQUETTING ROLL

William D. Armbrust, Greensburg; Dennis J. Shallenberger, Latrobe, and Charles E. Hill, Whitney, all of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Division of Ser. No. 455,518, March 28, 1974, Pat. No. 3,883,282. This application Feb. 7, 1975, Ser. No. 548,155
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² B29C *3/02*
U.S. Cl. 249—135 **9 Claims**

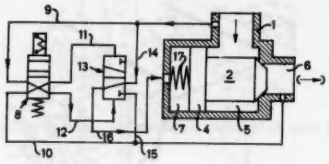


1. A die segment for a briquetting roll comprising; a body of hard wear resistant material having end edges and side edges and oppositely facing first and second major surfaces, one major surface having pocket means formed therein, the other major surface being disposed in a first flat plane, one side edge being disposed in a second flat plane at an angle to said first plane, and the other said side edge being in the form of an angular segment of an annular section of a cone.

3,981,478
FLUID FLOW CONTROL VALVE

Henning Börge Lündsgart, Karlslunde, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark

Filed Sept. 30, 1975, Ser. No. 618,016
Claims priority, application Denmark, Oct. 11, 1974, 5358/74
Int. Cl.² F16K *31/122*
U.S. Cl. 251—29 **4 Claims**

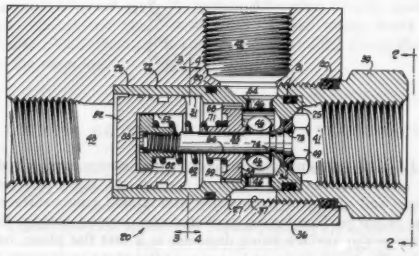


1. A fluid flow control valve, comprising in combination:
a valve housing having a first and a second chamber,
a valve seat in said housing between said first and second chambers,
a valve member linearly displaceable in said housing for cooperating with said valve seat,
a stepped piston rigidly connected to said valve member and having a first active surface subjected to the fluid pressure in said first chamber and an opposed second active surface of larger area, which second piston surface together with said housing defines a third chamber,
a four-way two-position switch valve having a first inlet port connected to said first chamber, a second inlet port connected to said second chamber, a first outlet port and a second outlet port, and signal receiving means for switching the valve to selectively connect each inlet port with one or the other outlet port,
a three-way two-position auxiliary valve having first, second and third ports connected to said first, second and third chamber, respectively, and fluid actuated means for selectively switching said auxiliary valve between a first position in which its said first and third ports are connected, and a second position in which its said second and third ports are connected,
and duct means connecting said fluid actuated means to the first and second outlet ports, respectively, of said switch valve.

3,981,479
CHECK VALVE

Frank L. Foster, Corry, and Wayne E. Wilcox, Union City, both of Pa., assignors to Snap-Tite, Inc., Union City, Pa.

Filed June 14, 1974, Ser. No. 479,194
Int. Cl.² F16K *31/163*
U.S. Cl. 251—63.6 **12 Claims**

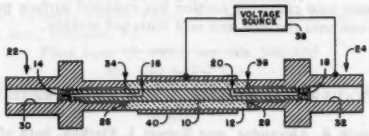


1. A pilot operated cartridge check valve including in combination a housing having first and second end portions and having internal wall means defining an opening, a valve seat formed on said internal wall means, a fluid port in said first end portion of said housing providing for the entrance of fluid to said opening, a valve member movable into and out of engagement with said valve seat to selectively prohibit and permit fluid flow through said opening at said valve seat, a control piston positioned in said second end portion of said housing, and movable between first and second positions, a valve stem connected to said valve member and extending axially to a position adjacent said control piston, a valve guide positioned in an intermediate portion of said housing and having a periphery located adjacent said internal wall means of said housing, said valve guide and said control piston defining a fluid chamber therebetween, a stop shoulder on said internal wall means, said valve guide engageable with said stop shoulder in a first position to limit movement of said valve guide in the direction of said valve seat and said valve guide movable away from said stop shoulder to a second position toward said control piston, a central opening in said valve guide, said valve stem slidably extending through said central opening, a fluid opening in said valve guide providing for fluid communication between said fluid chamber and said axial opening at said first end portion of said housing, said valve guide in said first position permitting flow from said fluid chamber only through said fluid opening and in said second position permitting free flow around said valve guide to said fluid chamber, and a spring member acting on said valve member and said valve guide tending to move said valve member into engagement with said valve seat and said valve guide into engagement with said stop shoulder.

3,981,480
VARIABLE GAS LEAK RATE VALVE

Errol P. Eernisse, and Gary D. Peterson, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 19, 1974, Ser. No. 534,333
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² F16K *31/02*
U.S. Cl. 251—129 **4 Claims**



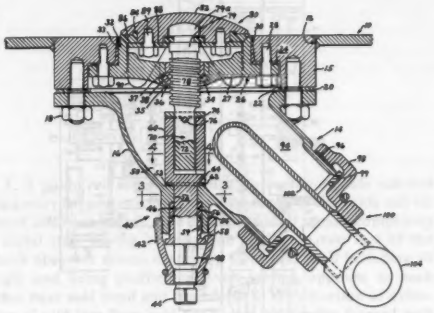
1. A variable gas leak rate valve comprising an elongated metallic rod having first passageway extending from one end of said rod to an opening in its outer surface intermediate the rod ends and a second passageway extending from the other end of said rod to an opening in its outer surface spaced from said first passageway opening; a piezoelectric sleeve fitted in gas tight relationship around a portion of said rod intermediate said passageway openings, said sleeve being poled in the radial direction and normally blocking gas flow between said openings; an electrode disposed on the outer surface of said sleeve coextensive with said gas tight portion; means for sealing the ends of said sleeve to end portions of said rod; and means for coupling voltage bias between said rod and said electrode to effect communication between said passageways through the interface between said rod and said sleeve.

3,981,481

BOTTOM OPERABLE TANK CAR VALVE

Charles E. Reedy, Bridgeton, and Edwin S. Carlson, St. Charles, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Oct. 8, 1974, Ser. No. 513,082
Int. Cl.² F16K *1/48*
U.S. Cl. 251—144 13 Claims



1. A bottom outlet comprising:

a valve body adapted to be integrally affixed to an opening in the bottom of a tank;

said valve body having a valve body opening defining a shoulder; a retainer assembly fitting within said valve body opening and urging a seal into engagement with at least a portion of said shoulder;

said retainer assembly having a threaded center portion and a vertical extension having a retainer opening therein; a seal and a housing affixed to said valve body with mechanical fasteners comprising a shear plane;

said housing having a housing opening therein; a valve operator assembly mounted within said housing opening comprising a first valve operator having a lower tool connection

and a first operator extension;

said first operator extension having a first valve operator opening therein in which a second valve operator is drivably engaged;

said second valve operator having threaded means comprising a second shear plane and adapted to engage said threaded center portion;

said second valve operator further having means for engaging a valve plug adapted to close said retainer opening;

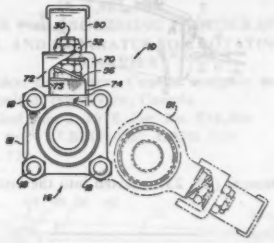
a seal member removably affixed to said valve plug whereby rotation of said first valve operator causes rotation of said second valve operator and vertical movement thereof, and whereby rotation and vertical movement of said second valve operator results in vertical movement of said valve plug from the closed to an open position, and whereby said valve operator assembly can be completely disassembled from the bottom; and whereby said first and second shear planes insure that upon severe impacts to said outlet, said housing and said valve operator assembly will shear off below said valve plug, thereby tending to maintain said valve plug in the closed position and maintain any lading within the tank during and after such impact.

3,981,482

FLUID SYSTEM DEVICE

Francis J. Callahan, Jr., Chagrin Falls; Bernard J. Gallagher, South Euclid, both of Ohio; Stephen Matousek, and Ulrich H. Koch, both of Moraga, Calif., assignors to Whitey Research Tool Co., Emeryville, Calif.

Division of Ser. No. 406,272, Oct. 15, 1973. This application Dec. 20, 1974, Ser. No. 534,607
Int. Cl.² F16K *51/00*
U.S. Cl. 251—152 19 Claims



19. A flow system device comprising:

a body section having a longitudinal through-flow passage which extends between a pair of generally parallel end faces, said body section having seal ring assemblies positioned about each end of said through-flow passage and which seal ring assemblies are axially removable from said body section, said body section further having a protrusion extending outwardly thereof substantially longitudinally therealong;

a pair of end fitting members each having a through opening, said end members being positioned on opposed ends of said body section in engagement with the end faces thereof with said through openings aligned with said through-flow passage;

at least three tie bolts extending between said end fittings for interconnecting said body section and end fittings with said tie bolts being spaced apart from each other around said end fittings, one of said tie bolts extending through said body section with the remaining tie bolts located radially outward of the body and said protrusion engaging another of said tie bolts, said at least three tie bolts being spaced apart in said end fittings such that removal of a single tie bolt other than said one and said another tie bolts and loosening of the remainder of said at least three tie bolts permits arcuate movement of said body section about said one tie bolt for gaining access to the through-flow passage of said body section.

3,981,483

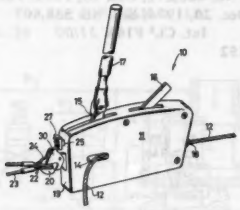
CABLE HAULING DEVICE

Johannes Augustus Rinio, 5 Promenade Venezia, Grand Siecle, 7800 Versailles, France

Continuation-in-part of Ser. No. 416,169, Nov. 15, 1973, abandoned. This application June 23, 1975, Ser. No. 589,524
Int. Cl.² B66F *3/00*
U.S. Cl. 254—76 16 Claims

1. A cable hauling device having an attachment hook fixed on a housing and clamp jaws mounted in two blocks, the clamp jaws being movable in opposite directions by two oscillatable rocking arms and which alternately clamp on a cable pulled through the device to take along this cable, a lever mechanism for releasing said clamp jaws from their clamping position, said lever mechanism comprising a control rod extending through the housing, wherein the control rod (25) is locked against release by a lock pawl (30) external of the

housing, said lock pawl being maintained in locked position by a suspension device, said suspension device including a sus-



pension element (22, 23) inserted into the attachment hook (20).

3,981,484

LIFTING APPARATUS

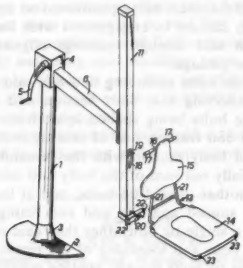
David Richard James, Hasfield, England

Filed June 21, 1974, Ser. No. 481,866

Claims priority, application United Kingdom, June 21, 1973, 29475/73

Int. Cl.[2] B66D 1/00

U.S. Cl. 254—148 12 Claims



1. An invalid hoist comprising an upstanding column, a load support structure projecting from the column and an elevating mechanism whereby a load supported at the end of the support structure remote from the column can be raised and lowered in a vertical plane, wherein the support structure comprises an arm projecting from the column at an angle inclined to the horizontal, which arm or a portion thereof is invertible to provide two alternative adjusted positions in which the arm is respectively inclined below and above the horizontal, and a load attachment member adjacent a lower end of which the load is rigidly attachable and which is slidable so as to be capable of rectilinear load-lifting movement in said vertical plane relative to the arm with the latter remaining at a constant height during raising and lowering of the load, with the attachment member capable of arcuate movement in a horizontal plane about a pivot axis offset from that member.

3,981,485

HELICOPTER TRANSPORTABLE DRILLING RIG

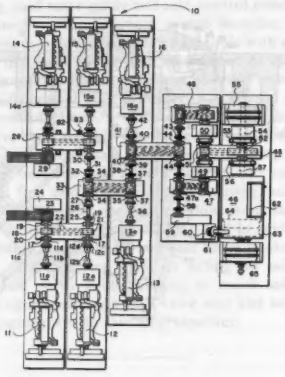
Kenneth Harmon Eddy, and Kenneth Harmon McGill, both of Beaumont, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 2, 1974, Ser. No. 511,407

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.[2] B66D 1/14

U.S. Cl. 254—186 R 15 Claims



1. A power system for an oil well drilling rig, said system being constructed of integral componets each being portable and having a weight of less than about 4000 pounds, said system comprising:

a plurality of prime movers arranged in close proximity to each other;

means for receiving and mounting each of said prime movers and for transmitting power from said prime movers; said means comprising an integral, portable unit for each said prime mover;

power transfer means interconnectable with said transmitting means and adapted to receive power from at least two of said prime movers via said transmitting means and to transfer said power to an output shaft, said power transfer means comprising a plurality of integral power transfer systems, each system being an integral unit fully transportable without disassembly thereof, and each said system having easily disconnected and reconnected power input and output means;

power accumulator means for receiving the power from all of said prime movers and having alternately selective dual power outputs;

transmission means connected to said accumulator means and having a high speed transmission connected to one of said accumulator means power outputs, and a low speed transmission connected to the other of said accumulator means power outputs;

main drum drive means releasably connected to both of said transmissions and arranged to selectively receive power from either of said transmissions and transmist power to two output shafts; said main drum drive means being an integral, fully portable unit in itself;

a main drawworks drum connected to one of said output shafts of said main drum drive means in driven relationship therewith; and,

main drum brake means connected to said main drum and arranged to apply braking forces thereto, said brake means comprising an integral brake system disconnectable from said main drum brake means without disassembly of said integral brake system.

3,981,486
SHOCK ABSORBER AND GUIDE RAIL ASSEMBLY INCLUDING THE SAME

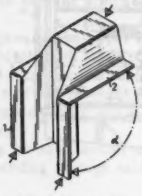
Ernst Baumann, Schonlaterngasse 11, Vienna I, Austria

Filed Jan. 29, 1973, Ser. No. 327,866

Claims priority, application Austria, Jan. 31, 1972, 715/72; Mar. 21, 1972, 2395/72; Aug. 9, 1972, 6899/72; Aug. 21, 1972, 7187/72

Int. Cl.[2] E01F *15/00*

U.S. Cl. 256—13.1 **20 Claims**



1. A guide rail assembly having at least one guide rail and stationary support means being connected to the guide rail via shock absorber means, said shock absorber means comprising a metal strip having at least one bend, the two legs of the shock absorber means extending from said bend including an angle and being profiled in cross section opposite to each other near said bend and transverse to the direction of extension of said legs from said bend, said strip being formed with folds at said bend, at least a part of at least one of said folds being dislocated upon moving the two legs toward each other, so as to reduce said angle, one leg of the shock absorber means being connected to the stationary support means and another leg being connected to the guide rail.

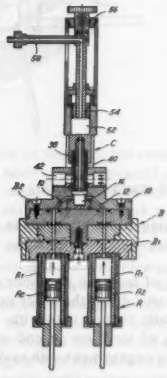
3,981,487
DEVICE FOR MIXING LIQUIDS IN KINETIC REACTIONS OBSERVED BY THE METHOD KNOWN AS STOPPED FLOW

Paolo Papoff, and Basilio Morelli, both of Bari, Italy, assignors to Consiglio Nazionale delle Richerche, Rome, Italy

Filed Jan. 16, 1975, Ser. No. 541,410

Int. Cl.[2] B01F *15/00, 15/02*

U.S. Cl. 259—4 R **6 Claims**



1. Mixing device for liquids employing the stopped flow method comprising injecting liquids through a mixing chamber then into an observation cell or chamber, comprising an annular chamber connected with at least two diametrically opposite supply or feed conduits for the liquids to be mixed with at least two diametrically opposite radial ducts of gradually decreasing cross-section in direction of flow and conveniently offset with respect to said supply or feed conduits so as to invert liquid flow direction by 90° and leading into the bottom wall of a central chamber which is co-axial with said annular chamber extending axially beyond the latter and communicating by asymetrical conduits with an observation cell whereby the liquids to be mixed will at first flow through curved paths in opposite directions then meet and flow centripetally through the radial conduits, to be deviated axially into a central chamber and then flow axially into said observation cell.

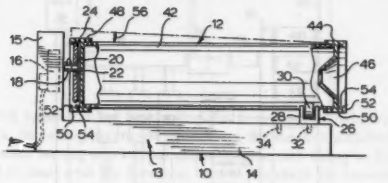
3,981,488
CARRIER FOR PROCESSING PHOTOGRAPHIC MATERIAL AND APPARATUS FOR ROTATING THE CARRIER

Simon Ratowsky, Downsview, Canada, assignor to Monrick Holdings Limited, Downsview, Canada

Filed Jan. 2, 1975, Ser. No. 538,004

Int. Cl.[2] B01F *9/00;* **G03D** *3/04*

U.S. Cl. 259—72 **8 Claims**



1. Apparatus for axially rotating and vertically oscillating a horizontally disposed cylindrical carrier for processing photographic material, the carrier having a ring projecting longitudinally from at least one end thereof, to form an internal trackway, comprising:

a frame;

vertically oriented eccentric means rotatably mounted on the frame and engagable with the ring of the carrier along the trackway thereof;

support means mounted on the frame and spaced from the eccentric means, the support means carrying rotatable means for cradling the carrier remote from the ring thereof; and

drive means to rotate the eccetric means.

3,981,489
AUTOMATIC HEAT TREATING SYSTEM

Hobart L. Wentworth, Barrington, Ill., assignor to Sola Basic Industries, Inc., Milwaukee, Wis.

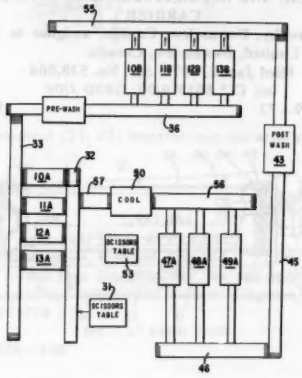
Continuation of Ser. No. 322,716, Jan. 11, 1973, abandoned. This application Sept. 19, 1974, Ser. No. 507,445

Int. Cl.[2] C21D *1/66*

U.S. Cl. 266—80 **3 Claims**

1. In a material heat and treating furnace system, the combination including a plurality of material heating and quenching furnaces, first conveyor means for receiving material to be treated, second conveyor means located transversely along and adjacent said heating and quenching furnaces so that material to be treated in a selected furnace can be selectively received thereby, means for selectively moving material to be treated from said first conveyor means to said second conveyor means, an automatic temperature sensing, atmosphere sensing and operation control means for each of said furnaces, loading and unloading means for selectively transferring material to and from said second conveyor means to a selected one of said heating and quenching furnaces, an automatic computer control means for each furnace and connected to its automatic temperature atmosphere and control means, said

computer control means being arranged to receive a selected pattern of treatment information for controlling signals therefrom and which in response to said signals will control said automtic temperature atmosphere and operation control means and will provide activating signals to the conveyor means to selectively move material in the selected pattern onto and from said first conveyor means to said second conveyor means and to a selected one of said heating and quenching furnaces, and which will activate the selected furnace for the preselected pattern of treatment in accordance with the treatment information to said computer control means when the material is moved into the selected furnace, the control means being activated for a selected furnace to transfer material thereto a predetermined time before the selected furnace



is in readiness to receive the material, the material being first moved from the first conveyor means to a pre-wash and drying means and held there until the selected furnace is ready to receive the same, there being draw oven means, post wash means and cooling means to which the material is selectively moved by the automatic control means to which the material is selectively moved by the automatic control means after being treated in one of said furnace means, and a plurality of draw oven means and cooling means located along a third unload conveyor with a post wash means between said second conveyor and third conveyor and a by-pass conveyor between said second and third conveyors across which material can be selectively passed to by-pass said post wash and draw oven means.

3,981,490

APPARATUS FOR DECOMPOSING ALKALI METAL AMALGAMS

Ivo Rousar; Vaclav Cezner, both of Prague; Milan Franz, Usti nad Labem, and Miroslav Matusek, Pardubice, all of Czechoslovakia, assignors to Vyzkumny Ustav Anorganicke Chemie, Usti nad Labem, Czechoslovakia

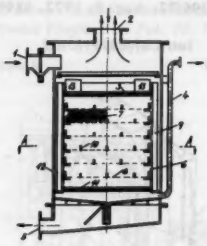
Continuation-in-part of Ser. No. 468,542, May 9, 1974, abandoned. This application May 5, 1975, Ser. No. 574,341

Claims priority, application Czechoslovakia, May 11, 1973, 3375-73

Int. Cl.² C25C *1/04*

U.S. Cl. 266—169 **2 Claims**

1. In an apparatus for decomposing amalgams of alkali metals, said apparatus having a tower with vertical wall means and a reaction body with perforated vertical means, and means for passing the amalgam and water through the tower and in contact with the reaction body therein, the improvement which comprises means providing an interstice for escape of hydrogen gas between the perforated vertical wall means of the reaction body and vertical wall means of the tower, and wherein the reaction body is of substantially uniform horizontal cross-section, said perforated vertical wall means are made of a metal chosen from the group consisting of steel, nickel and an iron-nickel alloy, and horizontally spaced perforated sheets in excess of two made of a metal chosen from the group consisting of steel, nickel and an iron-



nickel alloy, said horizontal sheets being supported by said perforated vertical wall means and packings of particulate bodies between these perforated sheets, said particulate bodies being made of material chosen from the group consisting of graphite and titanium carbide and having the form of pellets, balls, chips and the like, whose diameter is 3–20 mm.

3,981,491

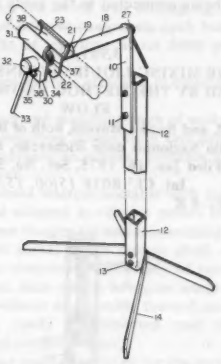
WORK STAND FOR BICYCLES

Donald H. Snyder, 128 S. Monroe St., Blissfield, Mich. 49228

Filed Nov. 28, 1975, Ser. No. 636,230

Int. Cl.² B25B *1/14*; B23Q *3/18*

U.S. Cl. 269—64 **1 Claim**



1. A bicycle work stand comprising

a. a support bar,

b. means for holding said support bar in an upright position,

c. a horizontal sleeve fixed at its outer end to said support bar,

d. a circular row of teeth on the inner end of said sleeve,

e. a relatively short tube at the inner end of said horizontal sleeve and axially aligned therewith,

f. a circular row of teeth on an end of said short tube to mesh in locking engagement with said first circular row of teeth,

g. a clamping plate fixed on the other end of said short tube and generally parallel to said support bar,

h. a clamping jaw on the upper end of said clamping plate,

i. a bushing rigid with said short tube and projecting within said horizontal sleeve in bearing relation,

j. a shaft fixed to said bushing and extending freely through said horizontal sleeve,

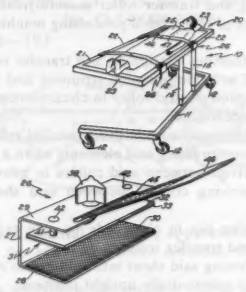
k. a screw threaded end portion on said shaft extending freely through said support bar to the outer side thereof,
l. a nut on said screw threaded portion adapted when tightened to bear against said support bar to cause said rows of teeth to lockingly engage, or when loosened to free said rows of teeth so that the clamping jaw can be revolved to a selected position,
m. a second screw threaded shaft rigid with said bushing and extending in a direction opposite to said first shaft,
n. a movable jaw plate similar to and at one side of said first jaw plate and through which said second screw shaft extends,
o. a clamping jaw on the upper end of said movable jaw plate to cooperate with said first clamping jaw,
p. a nut on said second screw shaft adapted to bear against the outer face of said movable jaw plate for forcing said movable jaw plate toward and in clamping relation to said first jaw plate,
q. a coil spring on said second screw shaft disposed between, and tending to urge said clamping plates apart, and
r. a jaw support plate on the lower end of one jaw plate having a hook-like projection to engage in an aperture in the other jaw plate to cause rocking of the plates for effecting clamping operation.

3,981,492

X-RAY TABLE PATIENT TRANSFER DEVICE OR THE LIKE WITH BODY HOLDING DEVICE

David R. Hallmann, 288 Nayatt Road, Barrington, R.I. 02806

Filed Aug. 4, 1975, Ser. No. 601,545
Int. Cl.² A61G *13/00*
U.S. Cl. 269—328 **2 Claims**



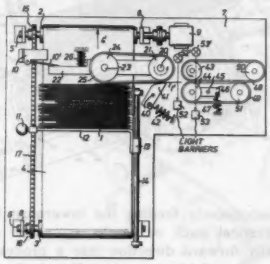
1. In an X-ray table or the like, the combination of a relatively flat horizontal body support means having rigid opposite side rails, clamps on said opposite rails, flexible straps secured to each clamp and extending from one side rail toward the other side rail, said straps being of a length to be in overlapping relation, means on said overlapping straps to secure them together in overlapping relation, said clamps comprising a pair of jaws, means to move said jaws toward each other to grip a side rail in a desired location along the side rail and releasable for adjustment along the side rail and re-gripping the rail, each of said clamps comprising a back to be disposed generally vertically when engaging said rail, a lower arm and an upper arm extending at generally right angles to the back, one of said arms serving as a gripping jaw and a second jaw movably mounted on the inner side of the other arm and means to move the second jaw toward and from the first said jaw, the last said means comprising a threaded collar on the said other arm and a threaded member extending through said collar and swivelly attached to said second jaw, each of said upper arms having a slot to receive said strap.

3,981,493

APPARATUS FOR SEPARATING A LETTER STACK

Karl Klappenecker, Constance; Gisbert Burkhardt, Insel Reichenau, and Hans Rapparlie, Constance, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Feb. 27, 1974, Ser. No. 446,203
Claims priority, application Germany, Feb. 27, 1973, 2309765
Int. Cl.² B65H *3/04, 5/02*
U.S. Cl. 271—10 **11 Claims**



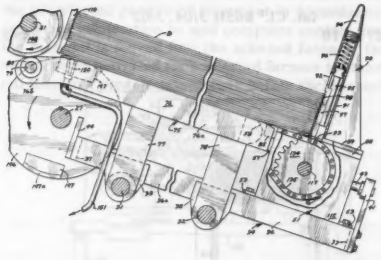
1. An apparatus for forwarding flat items individually from a stack, including means for supporting the stack; a withdrawing means having a principal gripping zone and being in frictional contact with the foremost item in the stack for forwarding the item to a standby position; a retaining mechanism being urged into contact with the withdrawing means; feed means disposed downstream of the standby position and having an item gripping zone; means generating a call signal; and advancing means for forwarding, upon receipt of the call signal, the item from its standby position into the gripping zone of the feed means; the improvement comprising in combination:
a. an item-moving mechanism being in continuous frictional contact with the foremost item in the stack and constituting, in a single structure, both said withdrawing mechanism and said advancing means; said item-moving mechanism including means for advancing the item in a direction parallel to its own plane;
b. drive means coupled to said item-moving mechanism for operating the same; said drive means having an energized state in which said item-moving mechanism is in an operating phase and a de-energized state in which said item-moving mechanism is in a non-operating phase;
c. a sole sensor positioned between the gripping zone of the feed means and the retaining mechanism for sensing the item as the latter arrives into the standby position; the distance between said principal gripping zone and said sole sensor being smaller than the shortest possible length of an item;
d. a control circuit connected to said sensor and said drive means, said control circuit including
1. input means for receiving the call signal;
2. means for energizing said driving means only when said sensor senses no item present;
3. means for energizing said drive means only when said sensor senses the presence of an item and the call signal is applied to said input means; and
4. means for de-energizing said drive means upon sensing the presence of an item by said sensor; and
e. means for stopping and restarting the motion of said item-moving mechanism for arresting the item in its own plane in said standby position upstream of said gripping zone of said feed means when said sensor senses the presence of the item and for subsequently advancing the item as a whole into the gripping zone of the feed means when said call signal is received by said input means.

3,981,494

BLANK FEEDER APPARATUS

Paul G. Prestegaard, 201 Westwood Drive, Minneapolis, Minn. 55416

Filed May 8, 1975, Ser. No. 575,713
Int. Cl.² B65H 3/04, 3/06, 1/06
U.S. Cl. 271—10 39 Claims



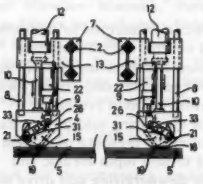
9. For successively feeding the lowermost blank from a generally vertical stack of blanks, one after another, in a longitudinally forward direction into a processing machine such as a carton folding machine, blank feeder apparatus comprising a frame, longitudinally extending slide means on the frame for supporting the stack of blanks, means on the frame for feeding the lowermost blank in the stack forwardly along the slide means into the processing machine, means on the frame and adjacent the front of the stack of blanks for blocking the movement of the stack of blanks other than the lowermost blank to said machine, and hold down means on the frame for constantly resiliently urging rear end portions of at least the lowermost part of the stack downwardly toward the slide means, said hold down means comprising a hold down member having forwardly facing serrations for engaging the stack rear edge portion, and means mounting the hold down member for limited generally vertical movement and constantly resiliently urging the hold down member downwardly.

3,981,495

PROCESS AND APPARATUS FOR SEPARATING SUPPLE SHEETS FROM A STACK

Gaspar A. H. Bijttebier, Grote Heerweg 64, B -8749 Beveren (Leie), Belgium

Filed Oct. 24, 1974, Ser. No. 517,626
Claims priority, application Belgium, Oct. 26, 1973, 806540; Oct. 26, 1973, 806541; June 27, 1974, 816940
Int. Cl.² B65H 3/22
U.S. Cl. 271—18.3 9 Claims



1. A process for separating one or more supple sheets from a stack comprising:

compacting the stack at least in the vicinity of its opposite lateral upper edges,

providing at least one sharp projection at each of said opposite lateral upper edges,

the projections at one of said edges being opposite the projections at the other of said edges,

subsequently to the step of compacting the stack, introducing sharp projections obliquely in the sheet or sheets near said edges in order to engage the sheet or sheets to be removed, said projections being pointed outwardly toward their respective said edges,

slightly releasing the pressure on the stack,

moving said opposite projections apart in opposite directions in order to tighten the sheet or sheets to be removed, and

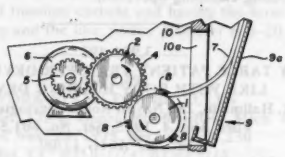
finally lifting from the stack the thus engaged and tightened sheet or sheets.

3,981,496

STRIPPING AND TRANSFER ROLLER ASSEMBLY FOR SHEET FILM PROCESSORS

Gerald A. Jensen, Wayzata, and Conrad E. Lee, Mound, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Oct. 14, 1975, Ser. No. 622,093
Int. Cl.² B65H 29/22
U.S. Cl. 271—80 2 Claims



1. A stripping and transfer roller assembly for discharging individual sheets of film from a processing machine and comprising,

a first roller forming a stripping and transfer roller,

a plurality of soft compressible stripping and transfer elements mounted on said roller in circumferentially spaced relation therearound,

a second roller positioned in close parallel relation to said first roller compressing said elements when a sheet of film is being driven between said rollers to provide positive frictional driving contact between said sheet and said rollers,

a film receiving bin in close side by side relation to the stripping and transfer roller,

said rollers driving said sheet into said bin to maintain said sheet into a substantially upright position,

said elements expanding beyond the periphery of said first roller as they are rotated out of contact with said second roller to strip said sheet from said first roller, and

said expanded elements then being rotated into engagement with the trailing edge of said stripped sheet to transfer said trailing edge laterally towards said bin and depositing said sheet in upstanding position into said bin.

3,981,497

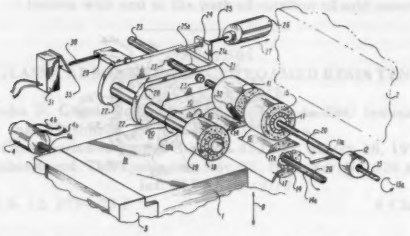
AUTOMATIC DOCUMENT ALIGNMENT METHOD AND APPARATUS FOR DOCUMENT FEED EQUIPMENT

Paul Feinstein, Jr., and Gary Leo Sokol, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 23, 1975, Ser. No. 589,301
Int. Cl.² B65H 3/06, 5/06, 7/14
U.S. Cl. 271—126 3 Claims

1. In apparatus for feeding documents from a stack and being of the type including a vertically movable platform for supporting said stack of documents, means for elevating said platform, a document feed assembly comprising a set of rotatably powered cooperating rollers and rotatably powered

picker roller means pivotally mounted for respective disengagement from and engagement with said stack for advancing a document from said stack to the nip point of said cooperating rollers; the improvement wherein said apparatus further comprises a sensor assembly responsive to the leading edge of each document passing through said nip point for initially



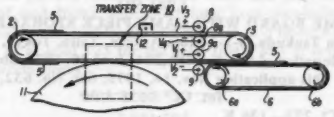
causing pivoting of said picker roller means out of engagement with said stack and further responsive to the trailing edge of each document to both interrupt the rotation of said cooperating rollers and allow said picker roller means to drop back into engagement with said stack and second means responsive to the momentum of said dropping picker roller means for incrementally elevating said document stack.

3,981,498

NON-UNIFORM CHARGING OF SHEET MATERIAL

Gerald M. Fletcher, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1975, Ser. No. 561,459
Int. Cl.² B65H *29/16*
U.S. Cl. 271—193 **11 Claims**



1. In a sheet material conveying apparatus having a conveying surface for conveying sheet material, the improvement comprising:

means for applying a non-uniform charge pattern over said conveying surface, and

means for applying a non-uniform charge pattern of opposite polarity over a surface of the sheet material being conveyed whereby an electrostatic tacking force holds the sheet material on the conveying surface, wherein both of said means comprises a roller having an outer cylindrical surface which is textured substantially throughout.

3,981,499

DEMAND LABEL TRANSFER WHEEL

Donald W. Watson, Arlington Heights, Ill., assignor to Xerox Corporation, Stamford, Conn.

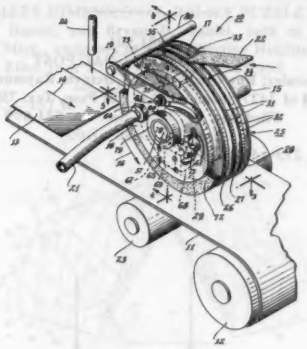
Filed Nov. 15, 1974, Ser. No. 524,092
Int. Cl.² B65C *9/08*; B65H *29/32*
U.S. Cl. 271—276 **8 Claims**

1. A transfer wheel of the type responsive to a vacuum source for transferring a label from a first station to a second station, comprising:

a cylindrical structure having a circular cavity axially extending into a side thereof and a plurality of holes disposed about the cylindrical surface of the structure, said holes communicating with the cavity;

means, rotatably coupled to the structure, for providing from the cavity a chamber with a port, at least one of the holes communicating with the chamber;

said means including a plate rotatably coupled to the structure; an annular seal for providing a fluid tight seal between the plate and the structure; a first device, coupled to the plate, for providing a fluid tight radial wall in the cavity; and a second device, coupled to the plate, for



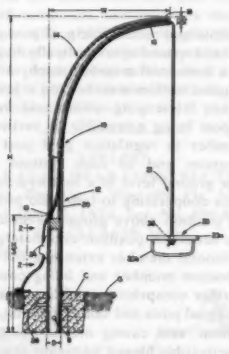
providing another fluid tight radial wall in the cavity, said port being located in the plate, one of the devices being securely fastened to the plate and the other of the devices being rotatably coupled to the plate, whereby the angular distance between the walls may be varied, and whereby if the vacuum source is connected to the port and the cylindrical structure is rotated with respect to the means providing the chamber vacuum pressure is periodically applied to the holes.

3,981,500

ADJUSTABLE SUPPORT APPARATUS

Vernon L. Ryan, 6802 Millikin Ave., Austin, Tex. 78723

Filed Oct. 17, 1974, Ser. No. 515,618
Int. Cl.² A63G *9/00*
U.S. Cl. 272—85 **15 Claims**



1. In combination:

an arcuate, flexible support rod, a channel being formed along the longitudinal axis of an upper portion of said rod;

a rope slidingly mounted in said channel, one end of said rope extending from an upper end of said rod, the upper end being substantially horizontal;

an opening in the upper portion of said rod adjacent a lower portion of said rod to allow the other end of said rope to extend from said rod;

a seat means connected to said one end of said rope; and

a quick-release locking means connected to said support rod for releasably securing said other end of said rope, the length of said rope extending from the upper end of said rod depending on the portion of said other end of said rope secured to said locking means.

3,981,501

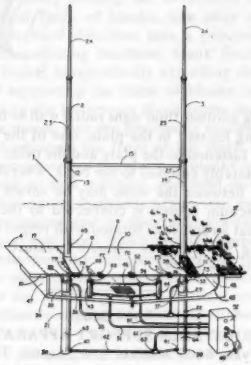
RETRACTIBLE GOAL POST

Ray Gonzalez; Roy Gonzalez, and Octavio Raymundo Gonzalez, all of 3427 Savannah Ave., El Paso, Tex. 79930

Filed Dec. 11, 1974, Ser. No. 531,699

Int. Cl.² A63B *67/00*

U.S. Cl. 273—55 R **5 Claims**



1. An extendible and retractable goal post device comprising two parallel and spaced apart vertically disposed goal posts connected by a horizontal member, each vertical post comprising an elongated bottom member and at least two coaxially telescoping tubes telescoping within said bottom member, each vertical post being extendible to vertically adjust said horizontal member to regulation goal post cross member height; the bottom end of each bottom member being mounted below ground level in a first hydraulic means, said hydraulic means cooperating to raise said post vertically to a fully extended position above ground level and to withdraw said post to a retracted position completely below ground level; said horizontal member extending between the upper end of each bottom member and being connected thereto; said device further comprising a subterranean casing means for housing said goal posts and said horizontal member in their retracted position, said casing means being provided with hydraulically activatible hinged lid means at ground level, said lid means being adapted to be raised to a substantially vertical position by a second hydraulic lifting means to permiit entry and exit of said goal posts and horizontal member into and from said casing and further being adapted to be lowered to a position flush with the ground; said lid means providing a covering for said casing when said goal posts and horizontal member are retracted or extended.

3,981,502

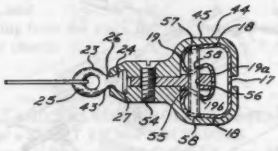
YOKE FOR GAME RACKET

William E. Portz, North Madison, Ohio, assignor to True Temper Corporation, Cleveland, Ohio

Division of Ser. No. 264,820, June 21, 1972, Pat. No. 3,908,995. This application Aug. 21, 1975, Ser. No. 606,541

Int. Cl.² A63B *49/02*

U.S. Cl. 273—73 G **11 Claims**



1. A game racket comprising an elongated frame member formed into a loop, converging portions forming a throat, and handle portions extending beyond said throat, said racket having a longitudinal axis; said loop having means for mounting strings thereto; a yoke connecting said converging portions across said throat; said yoke comprising a pair of complementary plate members having body portions disposed parallel with the plane of said loop; grip portions disposed at the ends of said body portions affording converging channels opening toward each other and nested over said converging portions; said body portions having edge portions closing said loop extending between said grip portions; a flat spacer of substantially the same shape as said body portions disposed between said body portions; said edge portions of said body portion having means for mounting strings thereto; and means securing said body portions and spacer together whereby said grip portions firmly engage said converging portions.

3,981,503

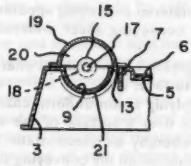
GAME BOARD WITH GAME PIECE STORAGE AREA

Mitsuo Tsukuda, 3-1-3 Moto-Askusa, Taito, Tokyo, Japan

Continuation of Ser. No. 481,204, June 20, 1974, abandoned. This application Nov. 14, 1975, Ser. No. 632,114

Int. Cl.² A63F *3/00*

U.S. Cl. 273—136 K **2 Claims**



1. A rectangular game board provided with an integrally formed raised support at its edges,

said game board having a rectangular upper playing surface upon which flat circular play pieces are deployed, a raised bead portion surrounding said playing surface and being an integral part of said game board and a marginal extension outwardly from a pair of opposite sides of the bead portion,

said game board having a depressed portion in at least one of said marginal extensions below and adjacent said surface forming a groove which is semicircular in cross-section and having end walls,

said groove forming a storage area for the play pieces,

a cover for the storage area comprising a semicircular cylindrical member having end walls and of slightly larger diameter than said groove,

cooperating means on the end walls of the groove and cover substantially along their axes for mounting the cover for rotary movements about said axes,

said game board having a slit therethrough along a side and a portion of the ends of the groove from said side to said cooperating means for receiving the cover and its end walls when moved to open about its rotary axis the portion of said slit along said side of said groove being coextensive with and in the path of rotation of said cover.

3,981,504

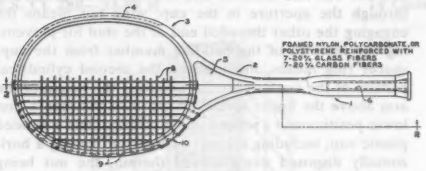
GLASS-CARBON REINFORCED FOAMED RESIN TENNIS RACKET FRAME

John D. Gugel, Columbus, Ind., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 452,302, March 18, 1974, abandoned. This application Nov. 25, 1974, Ser. No. 526,648

Int. Cl.² A63B *49/10*

U.S. Cl. 273—73 F **6 Claims**



1. A tennis racket frame comprising a unitary, injection molded tennis racket frame constructed of a fiber glass - carbon reinforced foamed resin having a specific gravity of less than 1, said resin frame having a head member, a handle section and an intermediate throat portion, a cellular core and a noncellular dense outer shell and containing at least 7 percent by weight glass fibers and at least 7 percent by weight carbon fibers, said fibers being oriented in a longitudinal plane in a random pattern relative to each other and following the contour of said frame with their long axes paralleling the longitudinal axis of said frame and wherein said fibers have an L/D ratio of at least 125 for the glass fibers and at least 225 for the carbon fibers

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3,981,505

PUZZLE WITH IRREGULAR PENTAGONAL PIECES

Marc G. Odier, 85 Blvd. Exelmans, Paris 16, France

Filed Mar. 1, 1973, Ser. No. 337,117

Int. Cl.² A63F *9/10, 9/20*

U.S. Cl. 273—157 R **2 Claims**

1. A puzzle comprising:

a plurality of substantially identically shaped planar puzzle pieces, each being in the form of an irregular pentagon having sides of substantially equal length and having apices defining consecutive angles of approximately 131°, 90°, 114°, 114° and 90°;

means forming indicia of value at each apex of at least one side of each puzzle piece, said indicia of value being selected from M possible values and where M is at least equal to two;

said indicia being formed on each side of each of said puzzle pieces with each side of each apex having identical indicia whereby turning over of each piece presents a mirror image of the configuration of indicia presented by that piece before turning over, said puzzle including twenty puzzle pieces, the total number of indicia configurations being thirty-two.

3,981,506

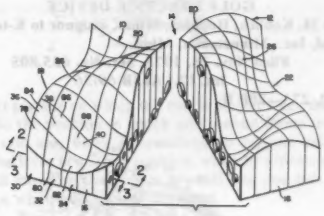
THREE DIMENSIONAL RELIEF PUZZLE

Wayne A. Daniel, and Bryan D. Daniel, both of Sterling Heights, Mich., assignors to Vesta, Sterling Heights, Mich.

Filed June 23, 1975, Ser. No. 589,468

Int. Cl.² A63F *9/12*

U.S. Cl. 273—157 R **3 Claims**



1. A three-dimensional relief puzzle comprising a plurality of puzzle pieces which are required to be initially assembled and fastened into a plurality of rows and subsequently assembled and fastened by rows into a composite having a rectilinear periphery, said puzzle pieces having substantially identical cross sectional areas and having varying heights substantially greater than the widths thereof, said puzzle pieces having planar side faces which are adapted to mate with each other in a predetermined manner to collectively form said composite, interlock means of varying sizes randomly disposed at predetermined varying heights in said side faces of said pieces except said faces which form peripheral surfaces of said composite, for securing said puzzle pieces to each other in said predetermined manner, said interlock means comprising projection means of varying size extending from the side faces of predetermined pieces of said puzzle and corresponding openings for close mating engagement with said projection means when said pieces are assembled into said rows and subsequently into said composite, said interlock means being thus disposed at a plurality of different heights throughout said composite, said puzzle pieces when assembled into said composite forming a planar lower surface and a curved upper surface describing a physical embodiment of a regular three-dimensional mathematical function.

3,981,507

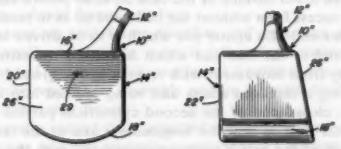
GOLF CLUB HEAD CONSTRUCTION

Charles Nunziato, Rte. No. 1, Westville, Fla. 32464

Filed July 22, 1974, Ser. No. 490,869

Int. Cl.² A63B *53/04*

U.S. Cl. 273—164 **1 Claim**



1. A golf club including an upstanding shaft portion having an enlarged head supported from its lower end, said head

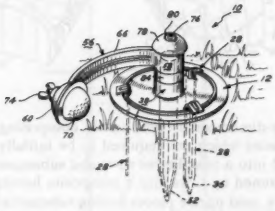
including top and bottom sides, generally parallel opposite inner and outer sides and front and rear sides, said shaft portion being slightly upwardly and outwardly inclined from the inner side of said head and being joined to the top side of said head adjacent said front side and said inner side thereof, said outer, rear and top sides being substantially mutually right angularly disposed, said front side being at least slightly rearwardly and upwardly inclined relative to said rear side, said bottom side being cylindrically convex about a front-to-rear extending axis, the radius of curvature of said convex bottom side being less than the maximum spacing between said top and bottom sides and the spacing between said inner and outer sides, said front side being inclined more than ten degrees relative to a vertical plane containing said shaft portion.

3,981,508

GOLF PRACTICE DEVICE

Jeffrey M. Koblick, Hopkins, Minn., assignor to K-tel International, Inc., Minnetonka, Minn.

Filed Nov. 28, 1975, Ser. No. 635,805
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—200 B **5 Claims**



1. An improved device for permitting right handed and left handed golfers to practice their golf swings in a relatively restricted or confined area, comprising:

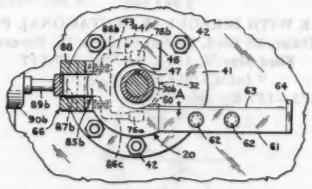
a molded plastic body including a flat, generally circular base which has an upper surface and a lower surface that is adapted to be in contact with the ground or the like; the body also including a center post which projects upwardly from the upper surface of the base and which is disposed so that its central longitudinal axis is substantially coaxial with the center of the base and is substantially perpendicular to the plane of the lower surface of the base; the base having a plurality of evenly spaced apertures disposed about its periphery, each of these apertures being adapted to receive a peg which is to be driven into the ground or the like and which is utilized to secure the body to the ground or the like; the center post comprising a first cylindrical portion and a second smaller diameter, cylindrical portion, with the first cylindrical portion being adjacent to the upper surface of the base, with a shoulder being formed at the juncture of the first and second cylindrical portions; and with the upper end of the second cylindrical portion terminating at an upper closed end; the center post also having an internal recess formed therein which extends from the lower surface of the base upwardly into the center post and which is open, adjacent to the lower surface of the base so as to permit access to the recess from without the body and so as to receive the upper end of a center pin which is to be driven into the ground or the like and which is utilized to restrain the body from movement with respect to the ground; a bolt having a threaded shank and being pressed into the upper, closed end of the second cylindrical portion of the center post so that the longitudinal axis of the threaded shank of the bolt is substantially coaxial with the central longitudinal axis of the center post and so that the threaded shank of the bolt projects upwardly beyond the upper closed end of the second cylindrical portion of the center post; an elongated, curved, molded plastic arm having a cylindrical, vertically disposed collar formed at one end thereof and having a horizontally facing cup formed at its other end, the collar being disposed about the second portion of the center post so that the central longitudinal axis of the collar is coaxial with the central longitudinal axis of the center post and so that the arm may be rotated in a horizontal plane about the central longitudinal axis of the center post and spaced a preselected distance above the upper surface of the base, the cup having a substantially hemispherical shaped, inner concave surface and having a centrally disposed aperture formed therethrough, the length of the arm, from the collar to the cup, being greater than the radius of the base so that the cup is positioned beyond the periphery of the base; a ball-like member having the appearance of a golf ball and being disposed in the cup so that at least a portion of the ball-like member is positioned without the cup and is visible to the golfer using the practice device; a double threaded ended stud, one end of which is screwed into the ball-like member and the other end projecting through the aperture in the cup; wing nut means for engaging the other threaded end of the stud for preventing the removal of the ball-like member from the cup; spacer ring means, mounted on the second cylindrical portion of the center post, for adjusting the height of the arm above the upper surface of the base between a first lower position and a second upper position; and a molded plastic cap, including a lower surface and having a horizontally disposed nut enclosed therein, the nut being threadedly engageable with the threaded bolt mounted in the upper end of the second portion of the center post, and the cap, when the nut threadedly engaged the threaded bolt, preventing the collar and spacer ring means from being removed from the center post.

3,981,509

LATCHING MEANS FOR RELEASABLY SUPPORTING A DRIVEN ROTATABLE MEMBER

William R. Myer, Frenchtown, N.J., assignor to Geometric Machine and Design Corporation, Woodbridge, N.J.

Filed Oct. 31, 1974, Ser. No. 519,548
Int. Cl.[2] B23B *33/00;* **B23Q** *1/08*
U.S. Cl. 279—1 R **15 Claims**



1. A support and latching means for a rotatable member comprising:

a. a base for connecting the support and latching means adjacent to the end of the rotatable member to be supported,

b. means forming a bearing in the axial line of the rotatable member,

c. means forming an arcuate wall shaped to define a transfer cavity in the axial line of the rotatable member and concentric with the bearing,

d. said arcuate wall means having a first portion thereon forming the lower support section of the transfer cavity and a second portion thereon continuous with the first portion forming an upper side section of the transfer cavity,

e. the upper side section of the arcuate wall means disposed on one side of a plane intersecting the vertical axis through the center of the transfer cavity and extending from the lower support section to a point short of said plane of intersection with the vertical axis so as to define a transport opening for movement of the rotatable member to be supported into and out of the transfer cavity,

f. means so connected adjacent the lower support section and on the side thereof opposite from the upper side section as to provide a supporting surface slightly higher than and parallel to a plane tangent to the lowermost portion of the transfer cavity formed by the lower support section of the arcuate wall means.

3,981,510

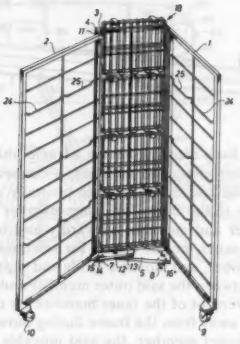
TRANSPORT CARRIAGE

Nils Henry Gustafsson, Alvsjo, Sweden, assignor to Swepall AB, Stockholm, Sweden

Filed June 3, 1975, Ser. No. 583,411

Int. Cl.² B62B *3/02, 11/00*

U.S. Cl. 280—33.99 H **14 Claims**



1. Transport carriage comprising a horizontally extending supporting means having at least one running wheel, and a vertically extending frame, said frame comprising a rigid rear wall and a pair of rigid side walls, at least one side wall being pivotally connected to said rear wall, a bearing pin interconnecting said supporting means and the rear wall of said frame to permit said frame to pivot about a vertical axis with respect to said supporting means, and at least one running wheel provided at the forward portion of each of said side walls, said frame being pivotal about said bearing pin, and said pivotal side wall being movable with respect to said rear wall between a first position wherein said side walls are parallel to each other for transport condition and a second position wherein said side walls diverge outwardly into nesting condition with another similarly constituted transport carriage.

3,981,511

DISPENSING CART

Lawrence Foster, 11 Ogden Road, Scarsdale, N.Y. 10583

Filed Feb. 12, 1975, Ser. No. 549,288

Int. Cl.² B62B *5/00*

U.S. Cl. 280—79.3 **14 Claims**

1. A dispensing cart comprising a main frame including a base, a first rigid frame member extending vertically from said base and a second frame member extending parallel to said first frame member and mounted for relative vertical movement with respect thereto; a plurality of shelves pivotally connected, in superimposed relation, to both of said frame members for movement between a first horizontal position and an inclined position tilted towards one side of the main frame, and means for raising and lowering said second frame member relative to said first frame member to move said shelves between said two positions, including a lever pivotally mounted on said base, a link pivotally connected at opposite ends to said second frame member and to said lever to raise and lower the second frame member upon pivotal movement of the lever in opposite directions, and a support arm rigidly secured to the lever and having a free end adapted to engage

the support surface on which the cart is placed when the lever is moved to the position in which said second frame member is raised; said arm being dimensioned to support said base adjacent the lever in a raised position, whereby articles on said shelves will move on the shelves towards said one side of the main frame when said shelves are tilted.

3,981,512

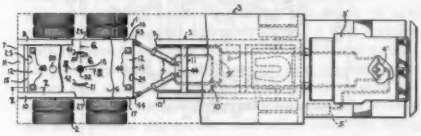
REAR WHEEL STEERING SYSTEM

Marvin D. Westover, Rte. No. 1, Amoret, Mo. 64722

Filed Mar. 24, 1975, Ser. No. 561,157

Int. Cl.² B62D *53/00*

U.S. Cl. 280—81.5 **4 Claims**



1. In a tractor-trailer combination:

a. a towing vehicle;

b. a trailer having a forward end adapted to be pivotally connected to said towing vehicle, said trailer having an elongated frame with a pair of spaced longitudinally extending side members connected by a plurality of longitudinally spaced transverse cross members;

c. a frame member fixed on the trailer frame adjacent a rear end thereof and extending under each of the trailer frame side members, said frame member having a downwardly facing bearing surface;

d. a rear wheel assembly having a mounting member with load carrying axles having rotatable ground engaging wheels, said mounting member being resiliently supported by said axles, said mounting member being under said frame member and having an upwardly facing bearing surface engaging the downwardly facing bearing surface of said frame member;

e. means on said frame member and mounting member pivotally connecting same together for rotative movement of said mounting member on a vertical axis centrally of the rear wheel assembly and on a longitudinal center of the trailer frame;

f. laterally spaced fluid actuated extensible members each having one end pivotally connected to a leading portion of the mounting member and the other end pivotally connected to the frame of the trailer forwardly of said mounting member and extension of one and contraction

of the other extensible members operates to rotate the rear wheel assembly about said vertical axis;

g. said mounting member having lock recesses each substantially spaced outwardly from said vertical axis;

h. lock structures on the frame member and an end having a lock tongue registering with a respective lock recess when the rear wheel assembly is in position for movement of the trailer in a straight longitudinal line and normally engaged in said lock recesses to retain the rear wheel assembly in said position;

i. means controlled from within the towing vehicle and operative to simultaneously release the lock tongues from the lock recesses to permit turning of the rear wheel assembly about said vertical axis; and

j. means controlled from within the towing vehicle and operative to selectively apply fluid pressure to said pair of extensible members to turn the rear wheel assembly about said vertical axis for steering the rear end of the trailer.

3,981,513

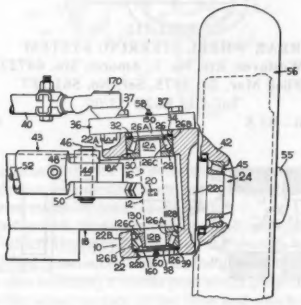
STEERING AXLE ASSEMBLY

Douglas W. Erskine, Homewood, Ill., assignor to Allis-Chalmers, Rumely, Ltd., Guelph, Canada

Filed May 27, 1975, Ser. No. 581,123

Int. Cl.² B62D *7/06*

U.S. Cl. 280—95 R **5 Claims**



1. A steering axle assembly for use on a vehicle, comprising a king pin extending through and secured to a transverse axle of the vehicle contiguous an end of the transverse axle, said king pin including opposite end portions thereof respectively extending above and below said transverse axle, a steering spindle comprising upper and lower flange members connected by a main body portion, said upper and lower flange members being respectively journalled for angular steering rotation about said end portions of said king pin which respectively extend above and below said transverse axle, a separate tapered roller bearing assembly interposed between each respective end portion of said king pin and the corresponding steering spindle flange, a stub axle carried by said main body portion of said steering spindle, said stub axle being adapted to support a wheel for rotation thereon, a steering arm having a portion thereof overlying and rigidly secured by threaded fastening means to the normally upper end of said steering spindle in covering relation to the normally upper end of said king pin and in covering relation to at least a portion of the normally upper end of said steering spindle, said steering arm being additionally in overlying covering relation to said tapered roller bearing assembly which is interposed between said upper flange member and the corresponding end portion of said king pin, and means interposed between the under surface of said steering arm and the upper surface of said last-mentioned tapered roller bearing assembly and acting in combination with the overlying connection of said steering arm to the upper end of said steering spindle whereby to simultaneously adjust the respective tapered roller bearing assembly which lies between each respective end portion of said king pin and the corresponding flange member of said steering spindle, said steering arm including a lever portion extending beyond said steering spindle to define a lever by means of which a steering torque is communicated to said steering spindle, said lever portion of said steering arm being adapted to be connected to link means for imparting a steering torque to said steering arm.

3,981,514

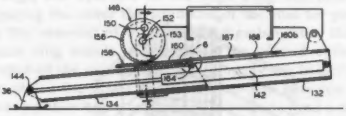
OUTRIGGER

Peter J. Visser, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Continuation-in-part of Ser. No. 406,749, Oct. 15, 1973, Pat. No. 3,909,040. This application Feb. 18, 1975, Ser. No. 550,403

Int. Cl.² B60S *9/02*

U.S. Cl. 280—765 **4 Claims**



1. An outrigger for a machine having a frame, the outrigger comprising an outer elongated member, a connection adjacent one end of the said outer member pivotally connecting the outer member to the frame, an inner member within the said outer member and movable outwardly and inwardly of the said outer member, power means for selectively moving the said inner member, and movable guide and support means interconnected between the said outer member and frame and responsive to movement of the inner member for causing the outrigger to pivot away from the frame during outward movement of the said inner member, the said movable guide and support means including a support member pivotally supported on the frame and a depending support structure extending beneath the said outer member and pivotally connected on a different axis to the said pivotal support member.

3,981,515

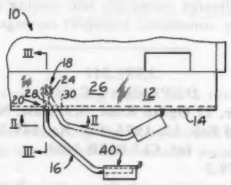
MOVABLE STEP OF A VEHICLE

Dean E. Rosborough, Blue Mound, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 22, 1975, Ser. No. 615,260

Int. Cl.² B60R *3/02*

U.S. Cl. 280—166 **4 Claims**



1. In a vehicle having a frame portion having a lower edge surface and a step member pivotally connected to the frame portion for generally upward and downward movement of the step member relative to the frame portion, the improvement comprising:

means pivotally connecting the step member to the frame at a location adjacent and spaced upwardly from the lower edge surface of said frame portion; and

a stop positioned at about the lower edge portion of the frame at an elevation greater than the lower edge surface of said frame portion and at a preselected location relative to the pivotally connecting means for restraining the step member against pivotal movement below a preselected elevation, said stop being an edge portion of a frame opening extending through the frame with the step member extending through said opening, said opening extending from a first end immediately adjacent the step along the frame to a second end of the opening with said second opening end being greater than said first opening end as measured transverse the frame.

3,981,516

BICYCLE AND TRICYCLE OF LOW WIND RESISTANCE AND OF LOW CENTER OF GRAVITY

Björn Häggkvist, Garvar Lundins Grand 7, Stockholm, Sweden

Filed Mar. 21, 1975, Ser. No. 560,953
Claims priority, application Sweden, Mar. 29, 1974, 7404244
Int. Cl.² B62K *5/06*
U.S. Cl. 280—263 **5 Claims**

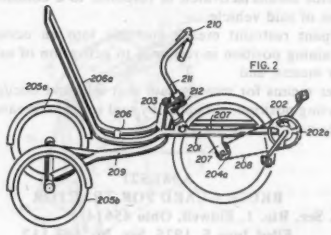


FIG. 2

1. A vehicle comprising in combination a forward frame having a front wheel rotably mounted at a forward point thereof, a depressed middle seat part, and an upwardly inclined rear back rest part; a rear frame positioned in tandem below and partly behind said first frame, the forward part of said rear frame being upwardly inclined, the front of said rear frame being pivotally joined to said forward frame at a place in said forward frame which is between the forward part of the seat part of said frame and the rear part of the front wheel of said vehicle, said pivot being inclined at such angle that the axis thereof, extended downwardly, substantially intersects the point of said forward wheel which normally is in contact with the ground, at least one of said frames being longer than half the wheelbase of said vehicle; at least one rear wheel being rotably mounted at a rear portion of said rear frame; means to pivot said frames relative to each other and thereby steer said vehicle; and drive means for said vehicle.

3,981,517

COUPLING MECHANISM ADAPTED TO LATCH OBJECT TO OBJECT SUBSTANTIALLY COTERMINOUSLY WITH UNCOVERING UNIVERSAL MOVEMENT MEANS BETWEEN OBJECTS

Gerald J. Crochet, Sr., 508 Beverly Drive, Lafayette, La. 70501

Continuation-in-part of Ser. No. 302,862, Nov. 1, 1972, Pat. No. 3,866,948. This application Feb. 18, 1975, Ser. No. 550,854
Int. Cl.² B62D *53/00*
U.S. Cl. 280—478 R **21 Claims**

1. Coupling apparatus for coupling first and second objects together for travel in tandem and including first coupling means carried by said first object and second coupling means carried by said second object:

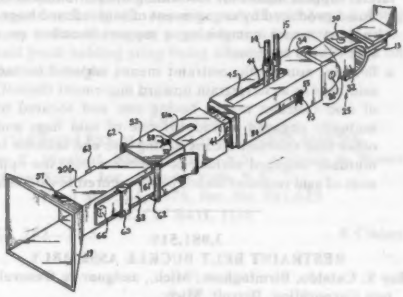
said second coupling means comprising second latch means;
said first coupling means comprising:

a universal joint assembly including an end component distal said first object and operative to permit pivotal movement of said end component with respect to said first object about three generally mutually perpendicular axes;

a universal joint control assembly;

one of said assemblies being connected to said first object; and

an extendable mechanism longitudinally extendable from said first object and retractable toward said first object, said extendable mechanism including first latch means linked to said end component of said universal joint



assembly and operative upon extension of at least a portion of said extendable mechanism to automatically engage said second latch means and thereby effect coupling of said first and second objects, said extendable mechanism further including the other of said assemblies, said other assembly having a first position with respect to said one assembly in which said universal joint assembly is locked against said pivotal movement and a second position with respect to said one assembly in which said universal joint assembly is freed for said pivotal movement, said other assembly being movable from said first position to said second position upon extension of said extendable mechanism; and

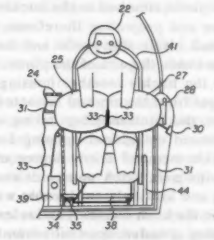
drive means connected to said extendable mechanism for extending and retracting said extendable mechanism.

3,981,518

VEHICLE RESTRAINT SYSTEM

Nathaniel H. Pulling, East Orleans, Mass., assignor to Liberty Mutual Insurance Company, Boston, Mass.

Filed May 5, 1975, Ser. No. 574,285
Int. Cl.² B60R *21/08*
U.S. Cl. 280—730 **6 Claims**



1. A safety system comprising:

a vehicle for providing human transportation, said vehicle comprising a front end that leads said vehicle during normal movement thereof;

seating means including a seat for accommodating a passenger of said vehicle, said seat comprising a substantially horizontal base portion for supporting the buttocks of the passenger and a substantially vertical back rest portion for supporting the back thereof;

inflatable air cushion means comprising a pair of independently inflatable bags one disposed on each side of said seat so as to be forced upon inflation into mutually engaging positions adjacent the abdomen of the passenger;

collision responsive detector means for simultaneously inflating said bags in response to detection of a collision or impending collision of said vehicle;

lateral support means for restraining the self-induced lateral thrust produced by engagement of said inflated bags, said support means comprising a support member on each side of said seat; and

a flexible, non-elastic restraint means secured to each of said bags so as to restrain upward movement thereof, one of said restraint means having one end secured to the mutually engaged surface of one of said bags and the other said restraint means having one end secured to the mutually engaged surface of the other bag, the opposite ends of said restraint means being secured to said vehicle.

3,981,519

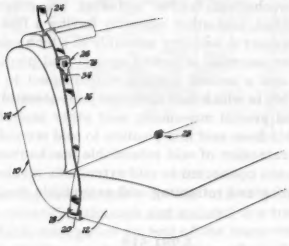
RESTRAINT BELT BUCKLE ASSEMBLY

Roy S. Cataldo, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 28, 1975, Ser. No. 599,855

Int. Cl.² B62B *35/00*

U.S. Cl. 280—744 **3 Claims**



1. In a seat belt assembly having a buckle member attached to a length of seat belt for movement with the belt between restraining and stored positions and a latch member mounted on a member of the vehicle body, the combination comprising: the buckle member having a buckle member housing, a round cylindrical pintle attached to the buckle member housing and having an end projecting therefrom, a plunger telescopically mounted inside the pintle and having a normal retracted position inside the end of the pintle, occupant actuatable means on the buckle member housing for selectively moving the plunger from the normal retracted position to an extended position, the latch member having a latch member housing with a round cylindrical opening for receiving the pintle of the buckle member at any degree of orientation of the pintle about its axis, latch means carried by the latch member housing and lockingly engageable with the pintle to retain the pintle in the latch member, and release means in the latch member being actuated upon movement of the plunger to the extended position by the occupant actuatable means to disengage the latch means from locking engagement of the pintle.

3,981,520

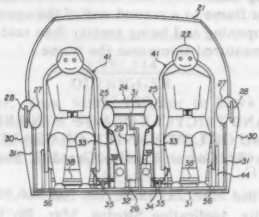
PROTECTIVE ENCLOSURE FOR PASSENGERS OF TRANSPORT DEVICES

Nathaniel H. Pulling, Framingham, Mass., assignor to Liberty Mutual Insurance Company, Boston, Mass.

Filed May 5, 1975, Ser. No. 574,286

Int. Cl.² B60R *21/10*

U.S. Cl. 280—748 **9 Claims**



1. A vehicle safety system comprising:

an occupant seat means;

detector means activated in response to a collision condition of said vehicle;

occupant restraint means movable into an occupant restraining position in response to activation of said detector means; and

mover means for moving said seat into and occupant protecting position, activated by said restraint means moving into said restraining position.

3,981,521

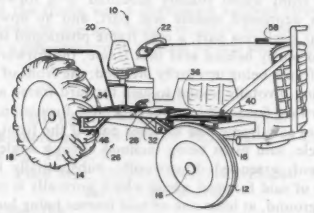
BRUSH GUARD FOR TRACTOR

Roy H. See, Rte. 1, Bidwell, Ohio 45614

Filed June 5, 1975, Ser. No. 584,112

Int. Cl.² B60R *19/00*

U.S. Cl. 280—760 **10 Claims**



1. Apparatus for mounting on a tractor having both a front and a rear axle with wheels on each end of each axle, said apparatus serving to (1) protect the driver from branches whipping upward after they are passed over by the front axle and (2) prevent obstructions which project upward above the level of either axle from immobilizing the tractor by passing into the zone defined by the two axles and two imaginary lines extending longitudinally from each end of the front axle to the end of the rear axle, on the same side of the tractor, the ends of the two lines being about at the center of rotation of each wheel, the apparatus comprising two guards, one for each side of the tractor,

each guard including a first bar attached to the tractor body at a spot above the level of the front axle, each said bar extending outward and backward from said tractor body generally toward the outside peripherial edge of the adjacent rear wheel,

each said bar being attached to a separate cross-piece, each cross-piece being attached to one side of the tractor body

about equidistant between the front and rear axles, each cross-piece extending outwardly from the tractor body a distance about equal to the distance of the adjacent front wheel from the tractor body,

a front deflector bar being attached to and extending from each cross-piece toward the center of rotation of the adjacent front wheel, each deflector bar terminating just short of the rearmost extension of the adjacent wheel,

a rear deflector bar on each side of the tractor being attached to and extending from the adjacent cross-piece toward the outermost periphery of the adjacent rear wheel, each rear deflector bar terminating just short of the forwardmost extension of the adjacent wheel,

all parts of said guard being disposed at a level at least as high as the lowermost portion of either axle.

3,981,522

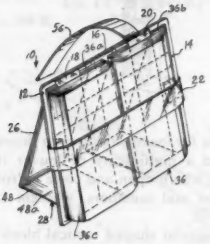
BOOK HOLDER

William Bloom, North Bergen, N.J., assignor to Emjay Industries, Inc., Hoboken, N.J.

Filed May 28, 1975, Ser. No. 581,471

Int. Cl.² B42D *3/04*

U.S. Cl. 281—34 **3 Claims**



1. A bookholder, comprising:

a. a pair of cover panels,

b. a back panel hingedly connected between said cover panels,

c. book-holding means on said cover panels, and

d. a spring element extending transversely of and mounted in said cover and back panels,

e. said spring element being secured to said cover and back panels and normally extended in a generally common plane to support the book holder in a substantially flat, open position,

f. said spring element being bendable transversely of its length when the book holder is closed,

g. said spring element comprising a resilient strip formed with a transverse curve along its length to provide it with structural stiffness and to keep it in extended position,

h. whereby the book holder is held in open position,

i. said resilient strip being transversely bendable to flatten its transverse curve when the book holder is closed,

j. the book-holding means comprising a pair of book-holding bands which are secured at their upper ends to the upper ends of the cover panels and which are secured at their lower ends to the lower ends of the cover panels,

k. said book-holding bands and said cover panels forming pockets between them which are adapted to receive and hold the covers of a book, whereby the book is held in place on said book holder,

l. a strut provided on the back of the cover and back panels to support them in easel fashion,

m. said strut being hingedly connected at its upper end to the upper ends of said cover and back panels,

n. restraining means interconnecting the lower end of said strut with the lower ends of said cover panels,

o. said restraining means being foldable to enable the strut to swing to a position substantially flat against the cover and back panels,

p. said strut being formed of a pair of superposed flexible plastic sheets which are joined along their respective edges and are provided with a pair of spaced stiffener boards between them,

q. whereby the strut is structurally capable of supporting the book holder and a book held thereon, in easel fashion,

r. said strut being foldable in the space between its stiffener boards to coincide with the hinging action between the back and cover panels,

s. a book-holding strap transversely disposed across the book holder,

t. means securing one end of said book-holding strap to one cover panel adjacent its outer side edge, and

u. means securing the opposite end of said book-holding strap to the other cover panel adjacent its outer side edge,

v. said book-holding strap being adapted to hold a book on the book holder.

3,981,523

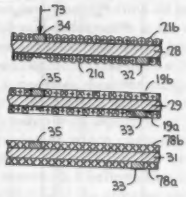
CARBONLESS MANIFOLD BUSINESS FORMS

George E. Maalouf, Niagara Falls, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,623

Int. Cl.² B41L *1/16*

U.S. Cl. 282—27.5 **8 Claims**



1. A manifold set of carbonless recording sheets comprising:

a stack including at least three superimposed sheets;

the initially uppermost and the middle sheets each having a coating on their respective back surfaces and the initially lowermost sheet having a coating on its front surface;

the back coating of the middle sheet comprising, as a reactive component thereof, a first reactive component of a first initially colorless color forming reaction system, and the front coating of the initially lowermost sheet comprising, as a reactive component thereof, a second reactive component of said first reaction system;

the front coating of the initially lowermost sheet also comprising, as a reactive component thereof, a first reactive component of a second initially colorless color forming reaction system and the back coating of the initially uppermost sheet comprising, as a reactive component thereof, a second reactive component of said second reaction system,

said first and second components of the first reaction system being capable of interreacting to produce a colored mark upon coming into reactive contact,

said first and second components of the second reaction system likewise being capable of interreacting to produce a colored mark upon coming into reactive contact,

said first component of the first system and said second component of the system being incapable of interreacting to produce a colored mark,

said first component of the second system and said second component of the first system being incapable of interreacting to produce a colored mark,

said middle sheet being initially disposed in overlying relationship to said lowermost sheet such that its back coating

is disposed against said front coating of the lowermost sheet, whereby upon application of pressure to the stack, said back coating of the middle sheet and the front coating of the initially lowermost sheet are forced together to bring the first and second components of the first reaction system into said reactive contact to thereby produce a colored mark,

said sheets being capable of rearrangement such that said initially lowermost sheet overlies said initially uppermost sheet with the front coating of the initially lowermost sheet disposed against the back coating of the initially uppermost sheet, whereby upon application of pressure to the stack, said front coating of the initially lowermost sheet and the back coating of the initially uppermost sheet are forced together to bring the first and second components of the second reaction system into said reactive contact to thereby produce another colored mark.

3,981,524

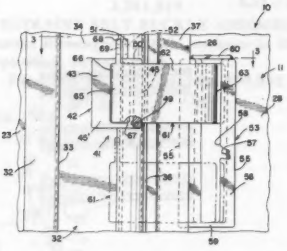
ANTI-PILFERAGE LOCK FOR BOX CAR DOORS

Jack E. Gutridge, Dyer, Ind., and James J. Schuller, Crete, Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed May 27, 1975, Ser. No. 581,193

Int. Cl.² E05C *1/04*

U.S. Cl. 292—31 **7 Claims**



1. In a railway car adapted for rolling on a railway track, said car having a body including a side wall provided with a door opening, and

door means movable between open and closed positions relative to said door opening, the improvement comprising;

a door lock mechanism mounted on said body at a vertical distance from said railway track substantially greater than the height of a person standing at track level beside said car to make the door lock mechanism substantially inaccessible to the person,

said door lock mechanism connected to the door means for releasably holding the door means in a closed position and including a keeper having a base member supported on said body and projecting outwardly relative thereto,

said base member including a vertically extending keeper recess open at its lower end,

a latch support rigidly connected to said door means,

said latch support being positioned at substantially the same height as said keeper,

guide means on said latch support,

a latching element having an arm extending horizontally from said latch support to said keeper,

said latching element including a tongue portion in a lock position retained within said keeper recess to lock said door in a closed position,

means connecting said latching element to said guide means to provide for guided vertical movement of said latching element relative to said keeper,

and means on said latch support for supporting said latching element below said keeper whereby said latching element may be moved vertically between lock and unlock position relative to said keeper.

3,981,525

SECURITY APPARATUS FOR LOUVER WINDOWS AND DOORS

George C. Mayes, 1512 Ellsmere Ave., Los Angeles, Calif. 90019

Filed Apr. 28, 1975, Ser. No. 572,011

Int. Cl.² E05C *19/18*

U.S. Cl. 292—259 R **8 Claims**

1. A security device for louver windows or doors having two lateral members and a multiplicity of louver lite brackets containing glass slats which open and close by rotating about attachment points on said members, wherein said security device is comprised of:

an elongated rectangular shaped vertical blocking member that is attachable to either of or both of said lateral members which prevents said brackets from rotating about said attachment point, lateral fastening means affixed to each end of said vertical blocking member for attaching said vertical blocking member to said lateral members and frontal fastening means affixed to said vertical blocking member whereby said vertical blocking member maybe clipped to said louver lite brackets.

3,981,526

SPIKE TOOL

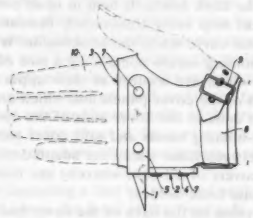
Karl Gustav Emanuel Lundqvist, Molinsgatan 4, S-411 33 Goteborg, Sweden

Filed Dec. 24, 1974, Ser. No. 536,096

Claims priority, application Sweden, Dec. 28, 1973, 7317511; Oct. 30, 1974, 7413643

Int. Cl.² B26B *27/00*; B65G *7/12*

U.S. Cl. 294—25 **3 Claims**



3. An improved spike tool, particularly intended to dig into slippery surfaces, such as ice and the like, comprising a spike

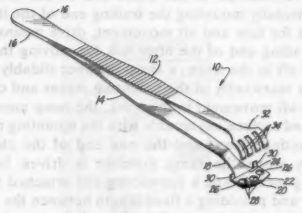
holder means, a substantially straight spike mounted on said spike holder means, and means attaching said spike tool to a hand, said spike holder means comprising a spike handle adapted to rest in the palm of the hand for gripping engagement with said hand, and a support rail extending essentially at right angles from said spike handle along the side of the hand opposite the thumb in a direction towards the wrist, the spike proper rigidly secured to said spike holder so as to extend in the plane of the hand transversely from said support rail, two straps operatively connected with said support rail, the first one of said straps arranged to be tightened around said hand and the second one of said straps arranged to be tightened about the wrist of said hand to attach said spike tool to said hand, a first set of apertures formed in said support rail, and a second set of apertures formed in said spike handle at the end thereof opposite said support rail, the first one of said straps passing through said first and said second sets of apertures.

3,981,527

TWEEZERS FOR USE WITH SEMI-CONDUCTOR WAFERS

John A. Ciano, Menlo Park, Calif., assignor to Interconsal Associates, Inc., Palo Alto, Calif.

Filed Apr. 7, 1975, Ser. No. 565,616
Int. Cl.² B25B 9/02
U.S. Cl. 294—99 R **2 Claims**



1. A tweezers having upper and lower elongated arms, each of said arms having a mounting end and a holding end, said mounting ends of said arms being located adjacent to one another and being secured to one another in such a manner as to permit said holding ends to be brought toward one another in which the improvement comprises:

said holding end of said lower arm includes a flat plate having a front edge, a back edge and side edges connecting said front and back edges and also includes a shoulder connecting said back edge with the remainder of said lower arm, said plate being positioned beneath said lower arm on the side thereof remote from said upper arm by said shoulder,

said holding end of said lower arm also including stop means for limiting the extent to which said plate can be inserted under an object, said stop means being located generally along said back edge of said plate and extending from said back edge generally toward said holding end of said upper arm,

said stop means comprising two tabs extending from said back edge of said plate, said plate being provided with a plurality of perforations extending through said plate, said perforations allowing liquid to drain through said plate,

said holding end of said upper arm includes a plurality of separate, resilient fingers spaced from one another and a support holding said fingers and connecting said fingers to the remainder of said upper arm, said fingers curving outwardly and downwardly from said support generally toward said plate,

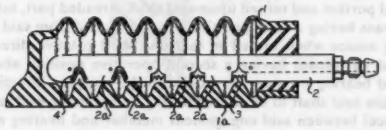
said arms being capable of being moved toward one another so that said fingers are capable of independently and resiliently engaging an object on said plate generally between said front and rear edges of said plate so as to hold said object on said plate.

3,981,528

ROBOT FINGER

Paul Andorf, Wettstetten; Dietmar Franz, Lampertheim; Alfred Lieb, Dossenheim; Gerd Upper, Gorsheimertal, all of Germany, and Walter Guttropf, Winisch, Switzerland, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed May 19, 1975, Ser. No. 579,113
Claims priority, application Germany, May 30, 1974, 2426086
Int. Cl.² B25J 15/00; B66C 1/46
U.S. Cl. 294—99 R **13 Claims**



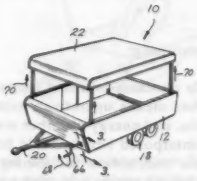
1. A robot finger comprising a substantially enclosed hollow elongated body, which body has integral therewith and running lengthwise thereof a gripping pad, said gripping pad bearing on an exterior wall of said body, said body being deformable by fluid pressure in the direction of said gripping pad, said griping pad being non-deformable in the direction of said body by said fluid pressure, said elongated body having a fluid injection inlet in a wall thereof, said hollow body having a longitudinally running supporting member yieldable only in the direction toward said gripping pad, said supporting member being in facing relationship with a portion of the walls of said hollow body the exterior of which carries said gripping pad, said supporting member having a circular cross section, said hollow body having therewith a bellows-like construction where the walls thereof which bear the gripping pad are corrugated, the depths of the folds of the bellows being substantially equal to the depth of the corrugations.

3,981,529

LIFT MECHANISM FOR A CAMPER TOP

Lloyd J. Bontrager, 60311 County Road 35, Middlebury, Ind. 46540

Filed Sept. 22, 1975, Ser. No. 615,776
Int. Cl.² B60P 3/32
U.S. Cl. 296—23 C **7 Claims**



1. In a camper having a wheeled body which includes side and end walls and a top shiftable between a collapsed position over said body and an elevated position spaced above said body, telescopic post means adjacent each corner of said body extending between the body and said top, guided elongated substantially incompressible flexible means associated with each telescopic post means for shifting said top between its collapsed and elevated positions upon endwise movement, power transmitting means, said power transmitting means

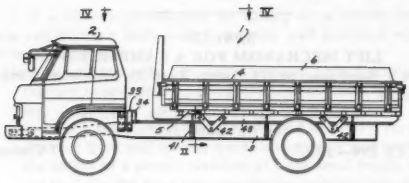
including a shaft journaled in said body and an engagement member secured to said shaft for rotation with the shaft, flexible drive member means passing around said engagement member and being associated with said flexible means for imparting said endwise movement to the flexible means upon rotation of said shaft, the improvement wherein one end portion of said shaft projects into an opening in one of said body side and end walls, bearing means journaling said shaft end portion for rotation and for axial movement relative to said one body wall, said bearing means including an abutment part, a ratchet wheel journaled upon said shaft and located between said engagement member and bearing means abutment part, a pawl carried by said body and engageable with said ratchet wheel to interlock with the wheel when said shaft attempts to turn in one direction, said shaft end portion terminating in an end and having a threaded part located between said end and bearing means abutment part, nut means carried by said shaft end portion and turned upon said shaft threaded part, said nut means having a first operative position spaced from said bearing means when turned in said one shaft rotative direction, said nut means having a second operative position abutting said bearing means when turned in the opposite direction to cause said shaft to be shifted axially compressing said ratchet wheel between said engagement member and bearing means abutment part for rotation with the shaft, said pawl engaging said ratchet wheel to prevent rotation of said shaft in said one shaft rotative direction when said nut means is in its second operative position, and crank means for engaging said nut means to turn said nut means between its first and second operative positions.

3,981,530

ENERGY ABSORBING LOADING TABLE MOUNT

Akira Yamanaka, Yokohama; Katsumi Terakado, Yamato, and Naofumi Nagaike, Yokohama, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1974, Ser. No. 498,854
Int. Cl.² B62D *27/06, 33/02*
U.S. Cl. 296—35 R **3 Claims**



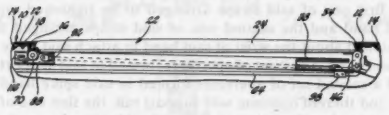
1. A truck comprising:
a body frame;
a loading table positioned on said frame;
energy absorber means operatively related to said frame and the table, said energy absorber means including friction plates interposed between said body frame and said loading table and means for joining said table to the frame, said joining means comprising metallic plates each having a lower portion secured to said body frame and an upper portion drilled with at least one bolt hole adapted to receive a bolt to secure the plate to said loading table, each plate being formed with a slot extending from one of said bolt holes in the forward direction and having a width smaller than a diameter of said bolt hole, said joining means being responsive to a force on said table in excess of a predetermined value for permitting movement of the table with respect to the frame whereby kinetic energy of said moving table is absorbed by said energy absorber means.

3,981,531

VEHICLE BODY SUNROOF

Joseph F. Koral, Sterling Heights, and Daniel L. Beaufait, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 15, 1975, Ser. No. 613,533
Int. Cl.² B60J *7/10*
U.S. Cl. 296—137 G **3 Claims**



1. In a vehicle body having a roof panel with an opening defined by a downwardly facing flange and a closure panel having a peripheral flange for sealing engagement with the downwardly facing flange of the roof panel to close the opening, a closure panel operating mechanism for moving the closure panel between open and closed positions and comprising: a track extending longitudinally of the vehicle, mounting means at one end of the closure panel and captured for fore and aft movement within the track, stop means for limiting forward movement of the closure panel, a lifter link having a leading end and a trailing end with the leading end being pivotally connected to the other end of the closure panel, means pivotally mounting the trailing end of the lifter link on the track for fore and aft movement, drive means connected to the trailing end of the lifter link for moving the lifter link fore and aft in the track, a ramp member slidably engaged in the track rearwardly of the mounting means and captured for fore and aft movement in the track, the ramp member having an inclined surface engageable with the mounting means to lift the mounting means and the one end of the closure panel vertically when the ramp member is driven beneath the mounting means, and a connecting rod attached to the ramp member and providing a fixed length between the ramp member and the trailing end of the lifter link whereby upon forward movement of the trailing end of the lifter link subsequent to the closure panel being stopped from further forward movement by the stop means, the leading end of the lifter link moves vertically to lift the other end of the closure panel vertically into sealing engagement of the flange while the connecting rod drives the ramp member beneath the mounting means causing the inclined surface to lift the mounting means and one end of the closure panel vertically, thereby lifting the closure panel vertically to carry the peripheral flange of the closure panel into sealing engagement with the downwardly facing flange of the roof panel.

3,981,532

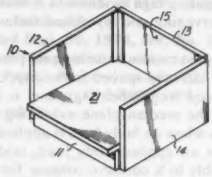
FOLDABLE FURNITURE

John W. Caldwell, 1829 Warwick Road, San Marino, Calif. 91001

Filed July 7, 1975, Ser. No. 593,366
Int. Cl.² A47C *4/00*
U.S. Cl. 297—42 **17 Claims**

1. A foldable article of furniture comprising: four elongated side members, each having a pair of ends and a dimension of height, one of said side members having a lesser dimension of height than the other side members, whereby to form a sill; hinge means attached to each of said ends whereby hingedly to connect adjacent ones of said side members in a quadrilateral array, opposite side members being substantially equal in length so that said array viewed in plan is rectangular, and the array can be folded through a parallelogram configuration at least to approach a flattened configuration; a transverse member hingedly attached to the sill adjacent to the outside edge thereof, whereby the transverse member can be hingedly moved to enter the inside of the array when rectangular and

be moved to a position outside of it on the opposite side of the sill from the interior of the array when flattened; and stop means on one of said side members so disposed, proportioned



and arranged as to support the transverse member from below at some position of the transverse member when hingedly moved to the inside of the array when rectangular.

3,981,533

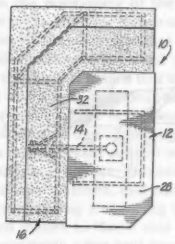
FURNITURE COMBINATION

Ferris E. Jones, 943 Millbury Ave., LaPuente, Calif. 91746

Continuation-in-part of Ser. No. 488,909, July 16, 1974, which is a continuation of Ser. No. 281,322, Aug. 17, 1972, which is a continuation-in-part of Ser. No. 81,241, Oct. 16, 1970, abandoned. This application Feb. 3, 1975, Ser. No. 546,204

Int. Cl.[2] A47B *39/00*

U.S. Cl. 297—173 **15 Claims**



1. A furniture combination comprising:

a seat including a generally horizontal seat portion and an upright back rest portion,

a table positioned in front of said seat having a supporting base including a pedestal and arm means rigidly attached at one end to the lower end of said pedestal and extending rearwardly toward the end of said seat, and a table top secured to the upper end of said pedestal above the level of said seat portion, and

pivot means adjacent the other end of said arm means located below said seat portion but a substantial distance above floor level pivotally mounting said arm on said seat for vertical swinging movement of said table about a pivot axis located above floor level between a lower portion of use wherein said table base rests on the floor and an elevated cleaning position wherein said table base is raised above the floor and said table top is located in an inclined position over said seat portion forwardly of said backrest portion to permit cleaning below the table.

3,981,534

SEAT COVER FASTENING SYSTEM

William L. Wilton, Waukesha, Wis., assignor to Universal Oil Products Company, Des Plaines, Ill.

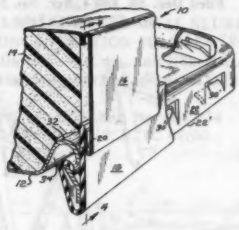
Filed June 27, 1975, Ser. No. 591,205

Int. Cl.[2] A47C *27/00*

U.S. Cl. 297—219 **6 Claims**

1. A seat cover fastening system comprising:

a formed seat pan having an inverted U-shaped peripheral edge portion, the outer vertical leg of said edge portion having a plurality of inwardly and upwardly directed tabs struck out of its surface at spaced locations around said edge portion which are located above the bottom of said vertical leg; seat cover material attached at its edges to a resilient trim strip having a generally J-shaped configuration and including an outer leg which is long and an inner



leg which is short, the inner leg having a lip portion formed at its upper end which extends downwardly and outwardly toward said outer leg, said seat cover material being attached to said outer leg and extending upwardly therefrom, and said resilient trim strip covering the lower portion of said outer vertical leg so that its inner leg extends above said tabs and said lip portion extends downwardly toward the space between said tabs and said outer vertical leg so as to be interlocked therewith.

3,981,535

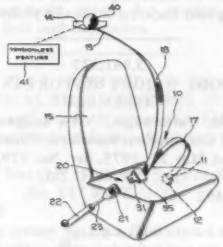
SINGLE RETRACTOR CONTINUOUS LOOP RESTRAINT SYSTEM

Cyril Henderson, Woodland Hills, and Albert R. Close, Sylmar, both of Calif., assignors to American Safety Equipment Corporation, Encino, Calif.

Filed May 27, 1975, Ser. No. 580,766

Int. Cl.[2] A47B *35/00*

U.S. Cl. 297—389 **12 Claims**



1. In a continuous loop restraint system for vehicles comprising a continuous loop of webbing anchored at a first end to the lower part of the vehicle and at its second end to the upper part of the vehicle and releasable anchor means releasably connecting the central portion of the webbing to the lower part of the vehicle on the other side of the user than the first mentioned anchor such that the portion of the webbing between the anchors at the lower part of the vehicle passes over the user's lower torso and the portion between the upper anchor and the releasable anchor passes over the user's upper torso, a retractor attached to the second end of the webbing to store excess webbing thereon, the improvement comprising the provision of:

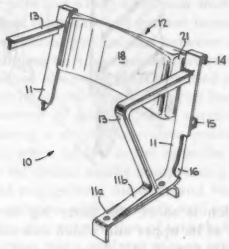
said releasable connector including limiting means for allowing the webbing to pass therethrough only in a direction to shorten the webbing portion over the lower torso and lengthen the portion of the webbing over the upper torso.

3,981,536

BACK SYSTEM FOR MODULAR SEATING

Wilmer R. Schultz, 1540 Chestnut St., Emmaus, Pa. 18049

Filed Dec. 30, 1974, Ser. No. 537,440
Int. Cl.² A47C 7/00
U.S. Cl. 297—444 **7 Claims**



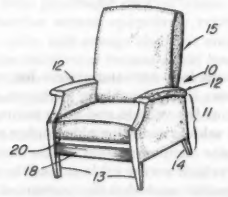
1. A backrest assembly for modular stadium seating or the like comprising:
upright support means attached to said seating;
a backrest module carried by said support means above said seating in position to engage and rest the back of the user;
said module having a lateral flange formed by a first portion extending substantially parallel to said module and a second portion turned at substantially a right angle to said module extending substantially parallel and in juxtaposition to said upright support;
clip means for gripping the lateral edge of said backrest means;
said clip means including a body, holding means on said body engaging said flange in opposed relationship to said upright support means and causing both said portions of said flange to engage snugly in substantially full face-to-face contact against said upright support; and
fastener means for attaching said clip to said support means for holding said backrest means in position.

3,981,537

PERSON'S BODY WEIGHT SUPPORT IN FURNITURE ASSEMBLY

John T. Wright, Cattaraugus, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Filed May 21, 1975, Ser. No. 579,447
Int. Cl.² A47C 7/02
U.S. Cl. 297—452 **4 Claims**



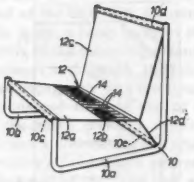
1. A seat support assembly in a piece of furniture for bearing some weight of a person's body comprising:
1. a relatively rigid peripheral frame having at least a pair of laterally-spaced panel supports;
2. a weight-bearing panel having laterally-spaced, anchoring edge zones with said panel including an upper layer against which body weight is to be applied and comprising cellulosic fibers, a lower tensile layer of metallic material having a moderately high modulus of tension, and a layer of set glue intervening said layers and fastening the latter together; and
3. anchoring support means fastening said panel edge zones to said pair of laterally-spaced frame supports in a manner whereby said weight-bearing panel is convexed upwardly above the median plane extending between said panel supports when no body load is applied to the panel, whereas under an applied body load, said panel is deflected reversibly to a concave contour for sling support of the body load.

3,981,538

RESILIENT PLATFORMS FOR SEATING

Anthony Guy Chubb, Naphill, England, assignor to Pirelli Limited, London, England

Filed July 31, 1975, Ser. No. 600,868
Int. Cl.² A47C 7/02
U.S. Cl. 297—454 **5 Claims**



1. A seat frame comprising:
a. a first horizontal frame member at the front of the frame and at seat level;
b. a second horizontal frame member at the back of the frame and above seat level;
c. a third horizontal frame member at the back of the frame and below seat level;
d. two spaced rigid side-frame structures between which said horizontal frame members extend; and
e. a resilient seating platform attached to said horizontal frame members and comprising:
i. first sheet means having first and second opposite edges, said first sheet means being secured along its said first edge to said first frame member, said first sheet means extending generally horizontally towards the back of the frame and including an elastic portion extending across the full width of said first sheet means; and
ii. second sheet means comprising a first portion having first and second opposite edges and a second portion having first and second opposite edges, said first portion being secured along its said first edge to said second frame member and along its second edge to said second edge of said first sheet means and said second portion being secured along its said first edge to said third frame member and along its said second edge to said second edge of said first sheet means.

3,981,539

WAGON DOOR CONTROL SYSTEM AND DUAL CAM THEREFOR

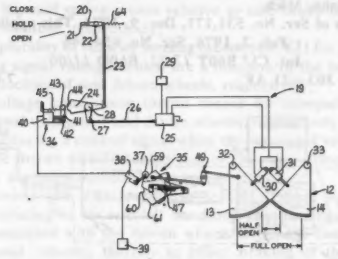
Bernard E. Proeschl; Ralph C. Schell, both of Decatur, and James M. Stanley, Oreana, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 30, 1974, Ser. No. 510,588

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² B60P *1/56*

U.S. Cl. 298—35 M **12 Claims**



1. In a wagon having a movable dump door means, the improvement comprising: control means selectively manually positionable in an Open position and a Close position; power means responsive to the positioning of the control means in the Open position to move the door means to an open position and to the positioning of the control means in the Close position to move the door means to a closed position; powered means for throwing the control means to a Hold position from either of said Open and Close positions; and cam means responsive to the movement of the door means by said power means to either of said open and closed positions to operate said powered means to throw said control means to said Hold position thereby stopping further movement of the door means in the selected door position, said cam means including means for selectively arranging a camming portion thereof to operate said powered means to throw said control means to said Hold position selectively when said door reaches a preselected partially open position intermediate said closed and open positions.

3,981,540

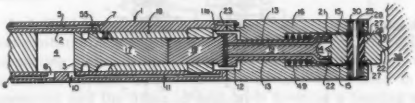
ROCK BREAKING APPARATUS

Ivor Hawkes, Lyme, N.H., assignor to Creare, Incorporated, Hanover, N.H.

Continuation of Ser. No. 408,724, Oct. 23, 1973, which is a continuation-in-part of Ser. No. 372,982, June 25, 1973, abandoned. This application July 18, 1975, Ser. No. 597,250

Int. Cl.² E21C *1/00*

U.S. Cl. 299—62 **16 Claims**



1. An impact roller cutter assembly comprising: a unitary, rigid annular metal cutter having an axis of rotation and including a radially outwardly extending peripheral cutting portion, said cutter having a separate outer peripheral impact receiving portion spaced radially inwardly of said cutting portion and being the only portion of said cutter adapted to have controlled actuating impact blows delivered thereto; an elongated shaft extending substantially coaxially with said axis and supporting said cutter and adapted to be supported by a housing; elastomeric bushing means having the outer periphery thereof in engagement with at least an inner peripheral portion of said cutter and extending radially inwardly therefrom; and said bushing means being of a stiffness to deform in response to individual impact blows of such impact blows providing limited transverse movement of said cutter with respect to the longitudinal axis of said shaft.

3,981,541

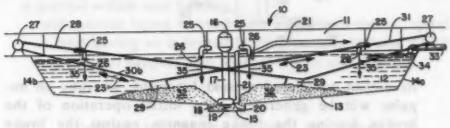
SHALLOW UNDERGROUND COAL SLURRY CONCENTRATION SUMP

Richard E. Doerr; David L. McCain, and Hilbert D. Dahl, all of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Apr. 15, 1974, Ser. No. 461,034

Int. Cl.² B65G *53/30;* **E21C** *47/00*

U.S. Cl. 302—11 **11 Claims**



1. In an underground mine slurry system including a sump for a plurality of slurry lines inside said mine wherein said mine has at least a tunnel, said sump comprising:

a sump means formed in the floor of said tunnel, said sump means having a bottom, side walls and ends, the length of said sump means equal to or greater than four times the depth of said sump means and said sump means adapted to be filled with water or slurry;

a depression;

pump means having an inlet and an outlet, said inlet communicating with said depression;

slurry removal means communicating with said outlet; a plurality of slurry outlet means spaced along said sump means and communicating with a plurality of respective mine faces whereby product deposited from said slurry outlet means will fall to the bottom of said sump means; and

mechanical conveying means for moving said product toward and into said depression.

3,981,542

ELECTRICAL BRAKE CONTROL SYSTEM

Max E. Abrams, and Jess E. Wahlenmaier, both of Arkansas City, Kans., assignors to Spring Machine, Inc., Arkansas City, Kans.

Filed Nov. 15, 1974, Ser. No. 524,056

Int. Cl.² B60T *13/74*

U.S. Cl. 303—20 **7 Claims**

1. In a braking system having a fluid circuit and an electrically operated braking system having one or more braking units, an electrical control circuit comprising:

a. a fluid pressure transducer means having a fluid input connected to said fluid circuit means, and producing an electrical output signal proportional to the fluid pressure of said fluid circuit;

b. comparator circuit means having 1st and 2nd inputs and an output;

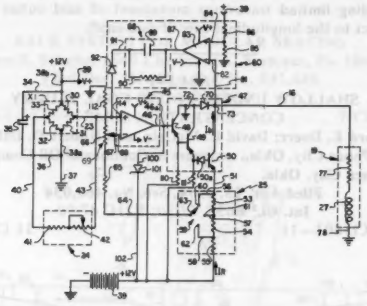
c. circuit means for connecting said 1st input to said electrical signal output of said fluid pressure transducer means;

d. circuit means connecting said output from said comparator circuit means to said electrically operated brake;

e. feedback means connecting said electrically operated brake to said 2nd input; whereby said comparator circuit means maintains the feedback voltage to said 2nd input substantially identical with the voltage at said 1st input by

controlling the magnitude of its output to said electrically operated brake; and

f. an impulse generating circuit means having its input connected to the input of said electrically operated brake and



its output connected to said 1st input, whereby an impulse will be generated upon initial operation of the brakes forcing the brake magnets against the brake drums.

3,981,543

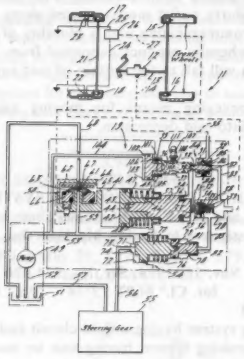
SKID CONTROL SYSTEM EMBODYING FAIL SAFE BYPASS

Thomas M. Atkins, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Division of Ser. No. 391,463, Aug. 24, 1973. This application Apr. 7, 1975, Ser. No. 565,556

Int. Cl.² B60T *8/02*

U.S. Cl. 303—21 AF **5 Claims**



1. A skid control system for a vehicle comprising a master cylinder for providing a source of actuating fluid pressure, a wheel cylinder for operating one wheel brake of the vehicle, a brake actuating circuit interconnecting said master cylinder and said one wheel cylinder, modulator means in said brake actuating circuit between said master cylinder and said wheel cylinder for reducing the pressure transmitted from said master cylinder to said wheel cylinder in response to a predetermined signal for preventing a skid condition, a bypass circuit interconnecting said master cylinder and said one wheel cylinder, a first valve element for controlling the flow of fluid from said modulator to said wheel cylinder, a second valve element for controlling the flow through said bypass circuit from said master cylinder to said one wheel cylinder, each of said valve elements being movable between an opened position and a closed position, and a common actuating means directly affixed to each of said valve elements for moving said first valve element from its opened position to its closed position simultaneously with movement of said second valve element from its closed position toward its open position.

3,981,544

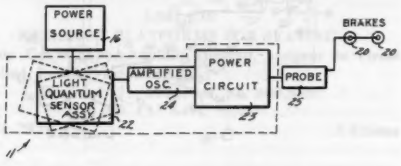
BRAKE CONTROLLER AND SHORT CIRCUIT PROBE DISCONNECT

Jerry J. Tomecek, Milford, and Philip J. Hagerty, Marshall, both of Mich., assignors to Tekonsha Engineering Company, Tekonsha, Mich.

Division of Ser. No. 531,171, Dec. 9, 1974. This application Feb. 2, 1976, Ser. No. 654,466

Int. Cl.² B60T *17/22;* **B60Q** *11/00*

U.S. Cl. 303—21 AF **7 Claims**



1. A brake control for brakes in towed vehicles and connected to a source of electrical energy comprising:

a light sensitive monitor;

inertially operated means attenuating light to said monitor;

a power circuit activated by said light monitor transmitting a pulse at a frequency proportional to the light as determined by said inertially operated means and connected to a source of energy and delivering said thus pulsed energy to brakes in a towed vehicle; and

a short circuit probe including an electromagnetic reed switch and capacitance timer connected to the power line through said power circuit and sensing amperage surges to provide intermittent disabling of power until said amperage surge is eliminated and in protection of said brake control.

3,981,545

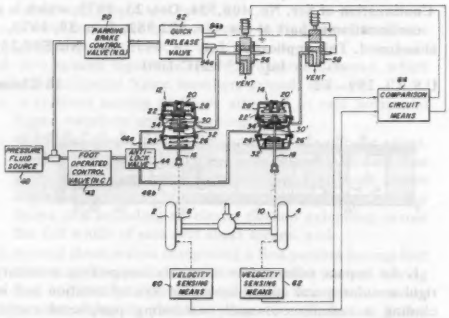
TRACTION CONTROL APPARATUS

William C. Eddy, Birmingham, Mich., assignor to Aspro, Incorporated, Westport, Conn.

Filed July 30, 1975, Ser. No. 600,505

Int. Cl.² B60T *8/08*

U.S. Cl. 303—21 EB **13 Claims**



1. A traction control system for a vehicle including at least one pair of driven wheels arranged on opposite sides of the vehicle and connected by a differential mechanism, a plurality of wheel brake means associated with said driven wheels, respectively, and a plurality of brake-operating means for

operating said wheel brake means, respectively, each of said brake operating means including a brake-operating member (24, 24') operable between brake-engaged and brake-released positions;

said traction control system comprising

a. a plurality of spring brake-locking means associated with each of said brake-operating members; respectively, each of said spring brake-locking means including

1. spring means (28, 28') normally placing the brake-operating member in its brake-engaged position; and

2. disabling means (22, 22') operable between enabling and disabling conditions for activating and de-activating said spring means relative to said brake operating member, respectively;

b. a plurality of velocity sensing means (60, 62) for generating signal voltages which are a function of the rotational velocities of said driven wheels, respectively;

c. voltage comparison circuit means for comparing said signal voltages of said driven wheels, respectively, and for producing a control signal when the rotational velocity of one driven wheel exceeds that of the other driven wheel by a predetermined value; and

d. means (56, 58) responsive to said control signal for operating to its enabled condition the disabling means associated with the driven wheel having the faster rotational velocity, thereby to effect braking of the faster driven wheel, whereby driving torque is transferred through said differential means to the driven wheel having the lower rotational velocity.

3,981,546

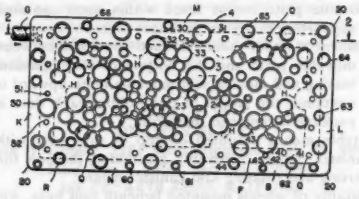
AIR BEARING CONSTRUCTION

Jacob H. Sperman, 2199 E. 21st St., Brooklyn, N.Y. 11229

Filed Sept. 29, 1969, Ser. No. 861,815

Int. Cl.² F16C *17/00*

U.S. Cl. 308—5 R 6 Claims



1. A fluid bearing for supporting a load for movement in a plane substantially parallel to the plate comprising a rigid load supporting plate having substantially parallel upper and lower faces, one of said faces forming a surface for a load to be supported and the other of said faces forming a bearing surface, an internal fluid conduit system intermediate said upper and lower faces, a plurality of spaced outlet orifices extending vertically transversely through the plate between the internal conduit system and the bearing face and a plurality of fluid retaining grooves on said bearing face forming closed ended fluid paths in said bearing surface for receiving a portion of the fluid discharged from said orifices and for restraining the flow of such discharged fluid along said bearing surface. The fluid to be Air or Gas continuously supplied under pressure thru an inlet.

3,981,547

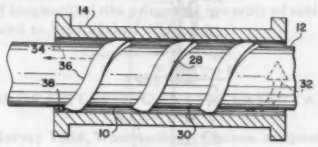
SPIRAL, TAPERED-LAND, JOURNAL BEARING

John E. Perruzzi, 7333 New Hampshire Ave. No. 114, Hyattsville, Md. 20783

Filed July 15, 1975, Ser. No. 596,119

Int. Cl.² F16C *29/00*

U.S. Cl. 308—98 6 Claims



1. A journal bearing comprising:

a bearing; and

a journal within said bearing,

said journal being formed with a circumferential, spiral land having an indented leading section to form an oil wedge to support said journal within said bearing.

3,981,548

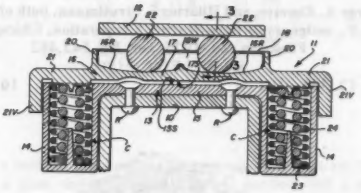
CONSTANT CONTACT SIDE BEARING

Robert W. MacDonnell, Crete, and Otto A. Shander, Chicago Heights, both of Ill., assignors to R. W. Mac Company, Crete, Ill.

Filed May 27, 1975, Ser. No. 580,667

Int. Cl.² B61F *17/00*; F16C *1/24*, *13/02*

U.S. Cl. 308—226 10 Claims



1. A side bearing for providing constant contact between a truck bolster and a railway car body and comprising base means rigid with the bolster, and providing cushion supports flanking the bolster cushioning means carried by said supports, top follower means bridging said bolster and supported on said cushioning means to undergo cushioned vertical travel above and below a pre-load position, said top follower means having an upwardly facing pocket overlying the bolster and defining an elongated raceway extending intermediate said cushioning means, and roller means disposed in said pocket in constant contact rolling engagement between the raceway and the car body.

3,981,549

THRUST BEARING WITH FORMED THRUST WASHER

Paul A. Carullo, Torrington, Conn., assignor to The Torrington Company, Torrington, Conn.

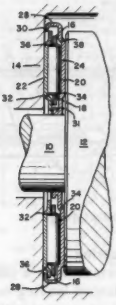
Filed Sept. 16, 1974, Ser. No. 506,277

Int. Cl.² F16C *33/38*

U.S. Cl. 308—235 7 Claims

1. A thrust bearing comprising: a thrust roller and cage assembly; and a formed sheet metal thrust race contacted by the round surface of the rollers in the thrust roller and cage assembly and having at least one annular shoulder; the dimensions of the formed sheet metal thrust race, and the dimensions of the thrust roller and cage assembly being such that the thrust roller and cage assembly may move radially with respect to the thrust race; and when the thrust roller and cage

assembly is coaxial with the thrust race, a radial space exists between said annular shoulder and the nearer radial ends of the rollers, the nearer radial ends of some of the rollers com-



ing into contact with said annular shoulder if the cage and roller assembly moves radially to thereby limit the radial movement of the thrust roller and cage assembly.

3,981,550

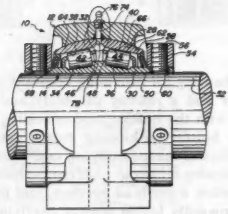
BEARING IMPROVEMENT

George A. Zimmer, and Hilarius S. Struttmann, both of Ithaca, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 20, 1975, Ser. No. 542,482

Int. Cl.[2] F16C *23/00*

U.S. Cl. 308—194 **10 Claims**



1. In a bearing assembly of a housing having a central opening and a bearing cartridge in said opening, said cartridge including inner and outer races and antifriction rolling elements in rolling engagement with said races, said housing having a lubricant fitting and passageway therethrough to said cartridge and said cartridge having an opening substantially opposite to said passageway for the passage of lubricant from said fitting into said cartridge, the improvement which comprises:

resilient means having an opening therethrough for the passage of lubricant located in said passageway adjacent to said cartridge, said resilient means being in rubbing contact with said cartridge, said resilient means defining the path of lubricant introduced at said fitting substantially to said cartridge opening and, restricting the flow of lubricant along the interface between the cartridge and the central opening of housing.

3,981,551

MEANS FOR TRANSPORTING YARN PACKAGES PRODUCED BY SPINNING MACHINERY

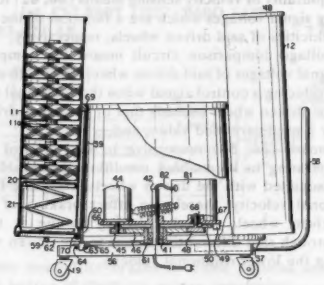
Tsutomu Miyazaki, Kariya; Takashi Kato, Toyota; Shozo Ueda, Kariya, and Toshio Yoshizawa, Chiryu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Feb. 4, 1975, Ser. No. 547,092

Claims priority, application Japan, Feb. 8, 1974, 49-16629; Feb. 8, 1974, 49-16630; Feb. 14, 1974, 49-17933[U]; Feb. 18, 1974, 49-19398[U]; Feb. 20, 1974, 49-20911[U]

Int. Cl.[2] A47F *1/00;* **B65G** *1/00;* **A47B** *49/00*

U.S. Cl. 312—250 **10 Claims**



1. A device for receiving and transporting a plurality of yarn packages produced by a spinning machine in the form of relatively large diameter cylinders with center bobbins, said device comprising:

a base;

canister means for containing said yarn packages therein with said center bobbins contacting each other, said canister means comprised of:

a plurality of individual cylindrical containers positioned in a circular arrangement about a central axis, said containers having unobstructed open tops for receiving said yarn packages therethrough and closed bottoms,

movable plate means fitted within each container for supporting said yarn packages thereon, and

resilient member means in each container between said movable plate and the bottom of said container for biasing and moving said movable plate upward in said container the length of one bobbin each time a yarn package is removed therefrom;

turntable means mounted on top of said base with said canister means removably positioned thereon for supporting and rotating said canister means;

a plurality of wheels mounted beneath said base, whereby movement of said base, said turntable means, and said canister means is facilitated; and

an upright cylindrical casing fitted over said turntable means on said base within the circular arrangement of said cylindrical containers.

3,981,552

SHOWCASE

Masashi Karashima, 40-7, Sangenjaya 2-chome, Setagaya, Tokyo, Japan

Filed May 20, 1975, Ser. No. 579,324

Claims priority, application Japan, Oct. 30, 1974, 49-124310

Int. Cl.[2] A47B *77/10;* **A47F** *5/00*

U.S. Cl. 312—250 **3 Claims**

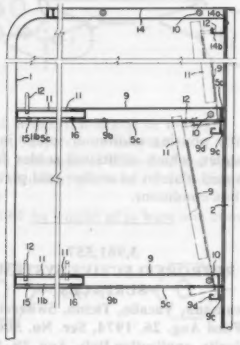
1. A multi-shelf showcase for displaying items, said showcase comprising:

an outside framework having front and back parallel vertical frame members;

a plurality of parallel, horizontal, vertically spaced shelf supports attached betwen said front and back frame members;

a plurality of shelving means pivotally attached between and resting upon each pair of parallel horizontal shelf supports within said framework for holding said items thereon, said shelving means being extensible, horizontally along said shelf supports and pivotable vertically upward;

latch means at the forward end of said shelving means for latching said pivotable shelving means in an upwardly vertical position;



first latch receiving means at the top inside rear portion of said framework for receiving and engaging said latch means of the uppermost shelving means when said uppermost shelving means is pivoted upward against said first latch means; and

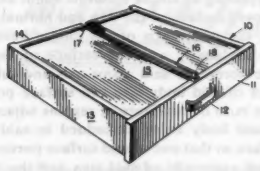
second latch receiving means integrally formed at the rearward end of each shelving means for receiving and engaging the latch means of the shelving means immediately therebelow when the uppermost of two vertically adjacent shelving means is pivoted upward and the lowermost shelving means of the two vertically adjacent shelving means is pivoted upward against said second latch receiving means formed at the rearward end of said uppermost shelving means.

3,981,553

DRAWER SLIDE

Kenneth H. Gutner, 3285 Dato, Highland Park, Ill. 60035

Filed Dec. 5, 1975, Ser. No. 638,067
Int. Cl.² A47B 88/00; A47F 5/08
U.S. Cl. 312—347 **2 Claims**



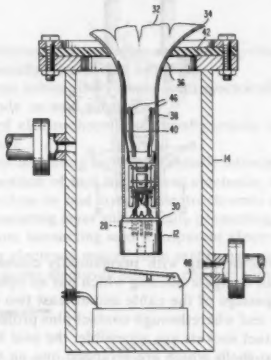
1. A slidable drawer structure comprising a frame such as a dresser or the like having a generally rectangular drawer-receiving front opening, a drawer slidably received in said opening, said frame being equipped with an elongated side-sloted center guide for the underside of said drawer with said guide extending generally perpendicular to said opening, an elongated slide fixed to the underside of said drawer and slidably engaging said guide, said slide being generally C-shaped in transverse section to engage said guide slots, said C-shaped defining a horizontal top wall integrated with vertical side walls and inwardly extending flanges integrated with said side walls below said top walls, said slide adjacent the inserted end of said drawer being equipped with transversely extending rib means, a longitudinal rib in each vertical side wall extending from said rib means to the other end of said slide, said longitudinal ribs projecting inwardly of said C-shape and adapted to bear against said guide.

3,981,554

METHOD OF AIR LETTING AN EVACUATED CATHODE RAY TUBE

Clinton Harvey Todd, Waubaushene, Canada, assignor to RCA Corporation, New York, N.Y.

Filed June 4, 1975, Ser. No. 583,605
Int. Cl.² H01J 9/50
U.S. Cl. 316—2 **7 Claims**



7. In a method for repairing an evacuated cathode ray tube having a glass envelope with a funnel portion and a neck portion and having a stem with electrical connection pins extending therefrom attached to said neck portion wherein the evacuated tube is initially opened, a defective component replaced by one of the desired quality and the tube is re-evacuated and sealed, an improvement in the method of initially opening the evacuated tube comprising the steps of:

a. inserting said electrical connection pins into a mating receptacle in a weight;

b. rotating the tube and applying a flame to the neck portion of said glass envelope causing localized heating around a circumference of said neck portion;

c. applying a mechanical shock to the heated circumference and reapplying said flame to the neck portion until said neck portion is cracked completely through around the circumference thereof;

d. then positioning said tube in support means in a substantially vertical orientation with said stem being in a downward position, and said stem and said cracked neck portion being oriented within a hermetic chamber;

e. evacuating said chamber of environmental atmosphere therein until the gravitational force exerted on said weight attached to said stem overcomes the forces on the stem due to friction and the pressure differential between the inside and outside of said envelope causing said stem to separate from said funnel portion at the circumferential crack in said neck portion and using said separated stem with the weight attached thereto to effect the cessation of further chamber evacuation and the start of admission of a non-contaminating gaseous atmosphere into said chamber;

f. admitting said gaseous atmosphere into said chamber in a gradual manner to prevent the conveyance of contaminated particles into said open tube until said gaseous atmosphere attains a pressure substantially equal to that of said environmental atmosphere; and

g. removing said tube from the support means and the hermetic chamber.

3,981,555

CONNECTOR PLUG WITH PERMANENTLY CONNECTED CABLE

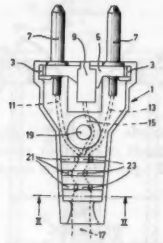
Johannis Martinis Deurloo, Emmen, Netherlands, assignor to Draka Kabel B.V., Hamerstraat, Netherlands

Filed June 24, 1975, Ser. No. 589,762

Claims priority, application Netherlands, July 4, 1974, 7409034

Int. Cl.² H01R *13/58*

U.S. Cl. 339—105 3 Claims



1. A connector plug with permanently connected cable, comprising an elongate housing which has an opening on one end for the passage of the cable and at least two openings on the opposite end wherethrough contact pins project or wherethrough contact sockets are accessible, the said housing consisting of two shells which are arranged one on the other by way of their edges, characterized in that for the strain relief of the cable (17) at least three transverse partitions (21) are provided in one of the shells (1), each partition comprising a cut-out (23) which opens into its free side and which includes a lower portion (25) having parallel sides near its closed end, the depth thereof being larger than and the width thereof being smaller than the largest and the smallest, respectively, transverse dimension of the cable (17), the said cut-outs (23) being positioned such that cut-outs (23) which are situated directly one behind the other are staggered in the transverse direction with respect to each other.

3,981,556

ELECTRIC CONNECTIONS OF WINDOW DEFOGGING DEVICES

Silvino Sabatelli, and Ivano Buoncristiani, both of Vasto (Chieti), Italy, assignors to Societa Haliana Vetro Siv S.p.A., Vasto (Chieti), Italy

Filed Feb. 6, 1975, Ser. No. 547,727

Claims priority, application Italy, Feb. 11, 1974, 48247/74

Int. Cl.² H01R *11/06*

U.S. Cl. 339—275 T 8 Claims

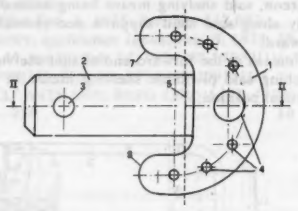
1. A method of connecting an electrical connector to a bus conductor connected to a system of spaced-apart wires for electrically heating a window pane comprising, in combination:

providing a platelet having a tongue integral therewith and connectable to a power supply,

bending said tongue to offset it from the remainder of said platelet,

making a plurality of holes in said platelet to allow venting of gases which form between said platelet and said bus conductor during soldering,

bringing one face of said platelet and solder into contact with said bus conductor and heating same to solder said platelet to said bus conductor while allowing gases to escape via said holes in said platelet, and



subsequently pouring additional solder into said holes in said platelet, which additional solder fuses with solder beneath said platelet to anchor said platelet more firmly to said bus conductor.

3,981,557

LIGHT RETROREFLECTIVE SYSTEM FOR SIGN SURFACES

Ludwig Eigenmann, Vacallo, Ticino, Switzerland

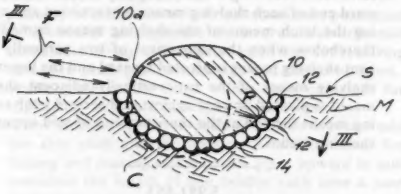
Filed Aug. 26, 1974, Ser. No. 500,663

Claims priority, application Italy, Aug. 29, 1973, 28320/73

The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.

Int. Cl.² G02B *5/126, 5/128*

U.S. Cl. 350—104 7 Claims



1. A light retroflective arrangement for use in a sign having an exposed surface, comprising a body of transparent material having an index of refraction less than 1.9, said body having an outer surface of a configuration corresponding to that obtained by rotating an ellipse about its minor axis equiplanar with the exposed surface of the sign and normal to the major axis thereof, the major axis of the ellipse being positioned substantially coplanarly with the surface of the sign and a central plane normal to said major axis and subdividing the entire surface of said body into two surface portions which have smallest radii of curvature in regions adjacent said central plane, said body being embedded in said sign at said exposed surface so that one of said surface portions is exposed and is located externally of said sign and the other surface portion is concealed and is accommodated within said sign, said body being elliptical in all its sections taken in planes perpendicular to said sign surface light rays impinging on said region of said exposed surface portion at a small angle to said central plane being focussed at said concealed surface portion; and reflective means adjacent said concealed surface portion and operative for reflecting said light beams focused at said exposed surface portion.

3,981,558

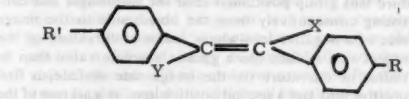
LIQUID CRYSTAL ELECTRO-OPTICAL DISPLAY

Chan Soo Oh, Diamond Bar, and Paul Y. Hsieh, Irvine, both of Calif., assignors to Timex Corporation, Waterbury, Conn.

Filed Nov. 12, 1973, Ser. No. 415,200
Int. Cl.² C09K 3/34; G02F 1/13
U.S. Cl. 350—160 LC 5 Claims

1. A liquid crystal material of positive dielectric anisotrophy comprising a mixture of:

A. from 50 to 95% by weight of at least one compound of the formula



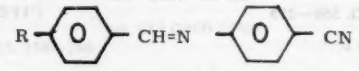
wherein

R is n-butyl, n-hexyl, n-heptyl or n-octyl;

R′ is ethoxy, butyloxy, or hexyloxy;

X and Y are hydrogen or chlorine; and when X is hydrogen, Y is chlorine, and when Y is hydrogen, X is chlorine; and

B. from 5 to 50% by weight of at least one compound of the formula



wherein

R is $CH_3—(CH_2)_n—O—$ or $CH_3—CH_2)_n$ —COO— wherein *n* is an integer.

3,981,559

LIQUID CRYSTAL DISPLAY

Donald Jones Channin, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 25, 1974, Ser. No. 527,054
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC 17 Claims

1. A method of operating a dielectrically anisotropic liquid crystal comprising the steps of:

applying to the liquid crystal a non-zero electric field Ey having its major component in a given direction;

concurrently applying to the liquid crystal a non-zero electric field Ex having its major component in a direction orthogonal to said given direction; and

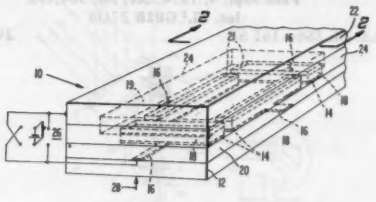
independently controlling the amplitudes of the Ex and Ey fields.

3,981,560

ELECTROCHROMIC DISPLAY DEVICE

Philip Michael Heyman; Robert Leon Quinn, both of Trenton, and Istvan Gorog, Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed June 16, 1975, Ser. No. 587,428
Int. Cl.² G02F 1/36
U.S. Cl. 350—160 R 11 Claims



1. An electrochromic display device comprising:

a substantially transparent substrate,

at least one substantially transparent electrically conductive electrode on said substrate,

a layer of electrochromic material partially covering said electrode,

an organic insulating layer substantially covering the uncovered portion of said transparent electrode, and

an electrolyte on said layer of electrochromic material with said insulating layer substantially preventing said electrolyte from contacting said transparent electrode, and

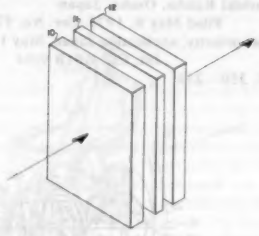
a counter electrode spaced from said transparent electrode, said counter electrode being in contact with said electrolyte.

3,981,561

OPTICALLY ACTIVATED EXCIPLEX SHUTTER/ATTENUATOR

Joel A. Weiss, Fairfax, and James P. Sheridan, Burke, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 16, 1975, Ser. No. 623,144
Int. Cl.² G02F 1/36
U.S. Cl. 350—160 P 6 Claims



1. An optically activated system for attenuation of incident optical radiation which comprises:

an optical radiation transparent housing;

an exciplex solution within said housing;

a first optical radiation filter for absorbing a desired short wavelength range while passing radiation of longer wavelengths;

a second optical radiation filter for absorbing optical radiation having wavelength greater than a desired wavelength while passing radiation of a desired wavelength range;

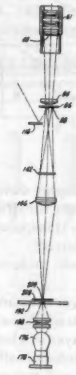
said housing including said exciplex solution positioned to receive all wavelengths of incident radiation with each of said first and second optical radiation filters positioned to receive radiation passing through said exciplex solution.

3,981,562

SPATIAL FILTERING FOR ERROR DETECTION

Erik W. Anthon, Santa Rosa, Calif., assignor to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Sept. 9, 1974, Ser. No. 504,498
Int. Cl.² G02B *27/38*
U.S. Cl. 350—162 SF **29 Claims**



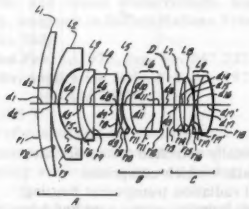
1. In a Fourier transform imaging microscope for examining parts carrying a repetitive stripe pattern, a source of light, means forming a slit through which said light passes, means including said part carrying the repetitive pattern for forming a Fourier transform image of the slit after the light beam passes through the part, means for suppressing the image of the stripe pattern of the part and for enhancing the defects in the stripe pattern including at least one slit having an orientation parallel to the first named slit, and means for positioning the slit in the Fourier transform image.

3,981,563

RETROFOCUS WIDE ANGLE LENS SYSTEM

Akiyoshi Nakamura, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 8, 1975, Ser. No. 575,493
Claims priority, application Japan, May 11, 1974, 49-52563
Int. Cl.² G01B *9/64*
U.S. Cl. 350—214 **19 Claims**



1. A retrofocus wide angle lens system comprising from the object to image side of the total lens system:

a first lens group consisting consecutively from the object side to the image side of a first positive meniscus lens having its convex surface on the object side, a first negative meniscus lens having its convex surface on the object side, a second negative meniscus lens having its convex surface on the object side and a second positive lens whose radius of curvature on the object side surface has a greater absolute value than its radius of curvature on the image side surface;

a second lens group positioned after the first lens group including a negative meniscus lens having its convex surface on the object side and at least one biconvex lens on the image side of the negative meniscus lens;

a diaphragm positioned rearward of the second lens group; and

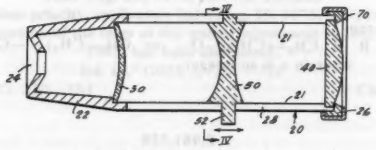
a third lens group positioned after the diaphragm and consisting consecutively from the object side to the image side of a negative lens whose radius of curvature on the object side surface has a greater absolute value than its radius of curvature on the image side surface, a first positive lens and a second positive lens, at least one of the three lenses of the third lens group being a cemented doublet.

3,981,564

LENS SELECTOR

Gerald Hoos, 1035 Wesley Ave., Evanston, Ill. 60202

Continuation-in-part of Ser. No. 224,642, Feb. 8, 1972, abandoned. This application Oct. 3, 1975, Ser. No. 619,195
Int. Cl.² G02B *7/02*
U.S. Cl. 350—255 **11 Claims**



1. A lens selector comprising

A. an elongated opaque housing having

1. an axis,

2. a generally cross-sectionally rectangular configuration,

B. a converging meniscus lens means fixed coaxially in said housing in spaced relationship to one end thereof, including mounting means therefor,

C. a plano-convex lens means fixed coaxially in said housing adjacent the opposite end thereof, including mounting means therefor, said plano convex lens means generally conforming in its perimeter contour approximately with the interior cross section of said housing and also approaching said interior cross section in its length and width dimensions,

D. said housing further having

1. a generally constant interior cross section between said converging meniscus lens means and said plano convex lens means, and

2. a longitudinally extending slot defined therein between said converging meniscus lens means and said plano convex lens means,

E. a biconcave lens means comprised of a clear plastic and coaxially located in said housing between said converging meniscus lens means and said plano convex lens means said biconcave lens means generally conforming in its perimeter contour approximately with said constant interior cross section and also approaching said constant interior cross section in its length and width dimensions, said biconcave lens means being adapted for longitudinal sliding movements coaxially in said housing,

F. handle means located adjacent said slot and accessable exteriorly relative to said housing for so slidably moving said biconcave lens means,

G. first rail means fixed to a first perimeter portion of said biconcave lens means and also fixed to said handle means extending transversely through said slot and being slidably engagable with longitudinal edge portions of said slot for guidance of said biconcave lens means during said longitudinal sliding movements thereof,

H. second rail associated with at least a second perimeter portion of said biconcave lens means and slidably engagable with portions of said housing, said second rail means cooperating with said first rail means to stabilize said biconcave lens means during said longitudinal sliding movements thereof,

I. said converging meniscus lens means said plano convex lens means and said biconcave lens means coacting together so that, as said biconcave lens means is so slidably moved, a focused image is substantially continuously visible adjacent said one end over a range of focal lengths extending at least about 10:1 focal length from wide angle to telephoto positions.

3,981,565

LIGHT-MODULATING DEVICE

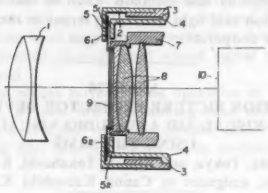
Tamotsu Karasawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1973, Ser. No. 408,266

Claims priority, application Japan, Oct. 28, 1972, 47-123933[U]

Int. Cl.² G05D *25/00*

U.S. Cl. 350—266 **4 Claims**



1. A light-modulating device comprising:

a mechanical diaphragm for the modulation of light, said modulation being a function of the adjustment of the aperture opening of said diaphragm, said diaphragm having relatively lower aperture accuracy for small aperture openings and relatively higher aperture accuracy for large aperture openings;

drive means for adjusting the aperture opening of the diaphragm; and

a neutral density filter element arranged to optically cover the aperture opening of said diaphragm means, said filter element having at least two regions of different density, one of said regions being a central first region which is centered at the optical axis and in which the density is constant with the radial distance from the optical axis, said first region for cooperation with said mechanical diaphragm for relatively lower aperture accuracy conditions, the other second region being contiguous with said first region, and havings its density vary linearly with the radial distance from the optical axis, said second region for cooperation with said mechanical diaphragm for relatively higher aperture accuracy conditions, whereby light modulation over a wide range is provided which varies as the product of the area of the diaphragm aperture opening and the transmittance of the effective portion of the filter element.

3,981,566

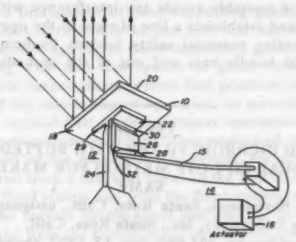
LEVER-ACTION MOUNTINGS FOR BEAM STEERER MIRRORS

Lee F. Frank, and James K. Lee, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,775

Int. Cl.² G02F *1/29*

U.S. Cl. 350—285 **11 Claims**



2. A light beam steering apparatus for use in optical tracking and scanning systems to redirect light beams over a predetermined angular range, said steering apparatus comprising:

a. a mirror for redirecting light beams incident thereto;

b. a bender-type driver for producing a motion signal in accordance with an actuating signal, said driver being fixed at one end and free to move at the other;

c. a controllable actuator means for supplying an actuating signal to said driver;

d. at least one support including a hinge coupled to said mirror for establishing a fulcrum axis for said mirror; and

e. means for coupling said driver to position said mirror, said means including a drive link coupled at one end to said mirror by means of a hinge and coupled at the other end to the free end of said driver, the spacing of said hinges, being preselected to transform said driver motion signal into a mirror rotation corresponding to the predetermined angular range.

3,981,567

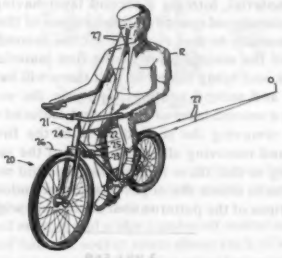
BICYCLE FRAME MOUNTED REAR VIEW MIRROR

John J. Cululi, 2315 Kemmerer St., Bethlehem, Pa. 18017, and Glenn R. Ash, 173 Ridge St., Emmaus, Pa. 18049

Filed Feb. 19, 1975, Ser. No. 551,048

Int. Cl.² G02B *5/08*; A47G *1/24*

U.S. Cl. 350—307 **11 Claims**



1. A frame mounted rear view mirror for a bicycle having a frame, wheels rotatably mounted on said frame, and handle bars disposed above said frame, said frame having at least one longitudinal bar member and at least one diagonal bar member, a head bar member being disposed above the forward one of said wheels and being connected to the forward ends of said longitudinal and diagonal bar members, the improvement

comprising a mirror assembly including mirror mounting means connected to one of said longitudinal, said diagonal and said head members for pivotal movement about an axis transverse to said longitudinal member, said mounting means including a mirror support element defining a mirror support surface lying at an angle facing upwardly and rearwardly and being disposed wholly below said handle bars, said mirror assembly further including a flat plane mirror mounted on said support element against said mirror support surface, whereby said mirror assembly avoids any interference with a bicycle operator and establishes a line of sight to the operator's rear while avoiding potential safety hazards by being mounted below said handle bars and out of the immediate vicinity thereof.

3,981,568

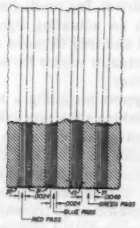
STRIPED DICHROIC FILTER WITH BUTTED STRIPES AND DUAL LIFT-OFF METHOD FOR MAKING THE SAME

Leroy A. Bartolomei, Santa Rosa, Calif., assignor to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Division of Ser. No. 305,692, Nov. 13, 1972, abandoned. This application July 1, 1974, Ser. No. 484,401

Int. Cl.² B05D *5/06;* **G02B** *5/28, 5/22*

U.S. Cl. 350—317 **8 Claims**



1. A method for forming supplementary pattern in a spatial relationship of first and second coatings on a substrate having a surface comprising, forming a first layer having a pattern of a first plurality of spaced parallel stripes of a first material on said surface of said substrate which is complementary to that required for the first coating, applying a first coating to the surface and overlying the pattern on the first material, forming a first layer of a second material on said first coating, removing the first layer of first material by etching so that there remains on the surface the first coating with an overcoat of the second material, forming a second layer having a pattern of second plurality of spaced parallel stripes of the first material complementary to that required for the second coating, said pattern of the second layer of the first material serving as a bias mask and being biased so that there will be an overlap of the first and second coatings, applying the second coating, applying a second layer of the second material on the second coating, removing the second layer of the first material by etching and removing all of the layers of the second material by etching so that there remains the first and second coatings in patterns in which the edges of the first and second pluralities of stripes of the patterns abut each other with no overlap.

3,981,569

EYEGLASS STRUCTURE

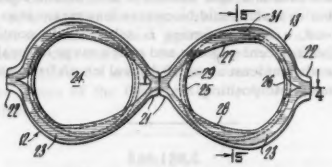
J. Robert Morgan, Palmer's Hill Road, Old Greenwich, Conn. 06830

Filed Dec. 16, 1974, Ser. No. 533,126

Int. Cl.² G02C *9/04*

U.S. Cl. 351—47 **5 Claims**

1. An eyeglass structure comprising a rear frame structure including a pair of circular portions connected by a nose bridge and a pair of temple supports and means for attaching them to the outer edges of said circular portions, each circular portion having an annular outwardly extending peripheral ridge adjoining the front edge thereof, a pair of substantively identical front portions each having an opening therein coordinated with the opening in one of said circular frame portions, at least the rear portion of the opening in each front portion being circular and having an annular recess in the wall thereof for removably receiving one of said annular ridges to rotatably secure the front portion to said frame, each of said front portions having similar outwardly extending elements on opposite sides thereof to overlie a portion of the nose bridge



and temple attaching means, the configuration of said front portions and outwardly extending elements being coordinated with the configuration of said rear frame structure and completely overlying and covering said rear frame structure and said nose bridge and temple supports to produce the effect of a unitary structure when said front portions are in selected adjusted positions relative to said rear frame structure with said elements overlying said nose bridge and temple supports and light modifying lenses carried by at least one pair of said portions whereby said elements when in said selected positions, position said light modifying lenses in the desired relationship for cooperation with the eyes.

3,981,570

MOTION PICTURE PROJECTOR DEVICE AS AUDIO-VISUAL AID AND AUDIO-VISUAL SYSTEM USING THE SAME

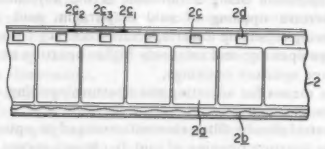
Akira Ashida, Tokyo, and Kiyoshi Takahashi, Kunitachi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 3, 1974, Ser. No. 476,107

Claims priority, application Japan, June 8, 1973, 48-64478; June 8, 1973, 48-64481; June 8, 1973, 48-64479

Int. Cl.² G03B *31/00*

U.S. Cl. 352—12 **7 Claims**



1. An audio-visual system for reproducing a strip of cinematographic film provided with an image information zone, along which a first image information, for motion projection, and a second image information, for still projection, are recorded in succession, and along which there are provided a first sound signal zone corresponding to said first image information, a second sound signal zone corresponding to said second image information, a transfer instruction signal zone, and a mode change-over signal zone, said system comprising in combination:

a. signal recording means having;

1. a sound signal recording medium and means for moving said recording medium continuously at a substantially constant speed; and

2. first transducing head means arranged to record a sound signal onto said sound signal recording medium, and of converting the thus recorded sound signal into an electrical signal;

b. film feeding means capable of feeding said film in a motion projection mode, and of temporarily stopping the film feeding for a still projection mode;

c. sound signal information reproducing means; and

d. a control device having;

1. second transducing head means for detecting a first sound signal along said first sound signal zone of said film and for directing the thus detected sound signal into said sound signal information reproducing means;

2. third transducing head means for detecting in sequence during movement of said film, a transfer instruction signal in said transfer instruction signal zone, a second sound signal in said second sound signal zone, and a mode change-over signal in said mode change-over signal zone; and

3. control means electrically connected to said first and third transducing head means, and said film feeding means to control the operations of said transducing head means and said film feeding means,

said control means being operative in response to said transfer instruction signal from said third transducing head means to cause the second sound signal and said mode changeover signal detected by said third transducing head means to be recorded onto said recording medium via said first transducing head means,

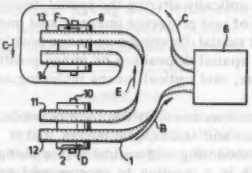
said control means also being operative in response to the detection of said mode change-over signal by said third transducing head means to control said film feeding means to stop the film feeding for said still projection mode and for simultaneously causing the signal recorded on said recording medium to be detected by said first transducing head means and for the thus detected signal to be directed through said sound signal reproducing means, and

said control means further being operative in response to the detection, by said first transducing head means, of said mode change-over signal recorded on said recording medium to return said film feeding means to its motion projection mode.

3,981,571
SPOOLING ARRANGEMENTS FOR ENDLESS BAND MATERIAL

Penrose David Robertson, London, England, assignor to Westrex Limited, London, England

Filed Apr. 4, 1975, Ser. No. 565,170
Int. Cl.² G03B *23/00*
U.S. Cl. 352—125 **9 Claims**

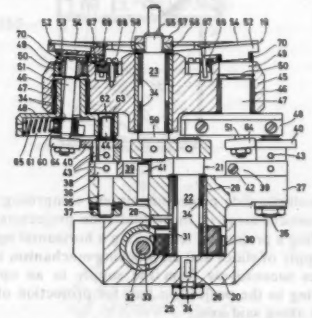


1. An arrangement for spooling endless band materials, and for controlling the said band material during a transport operation by which the entire length of the said band material is transported past a fixed station, comprising a first double spool adapted to receive and hold a loop of the band material and to carry substantially the whole length thereof in two spirals of the band material laterally spaced-apart, a second double spool adapted to receive and hold a loop of the band material and to receive and carry the band material from the first double spool in two spirals of the band material laterally spaced-apart, motor means for controlling the first double spool for rotation in the pay-off sense of the band material wound thereupon during a first half of the said transport operation, and in the take-up sense during the second half of the transport operation, motor means for controlling the second double spool for rotation in the take-up sense for the band material during the first half of the said transport operation, and in the pay-off sense during the second half of the transport operation, a first system of band-supporting guide members fixed in position relatively to the first and second double spools, a second system of band-supporting guide members co-operating with said first system of guide members and movable with respect thereto from first positions during the first half of the said transport operation, to second positions during the second half of the transport operation, the said band-supporting guide members being positioned, in the first said positions of the movable guide system, for guiding said band material from a first said spiral on the first double spool to the said fixed station and from the fixed station onto a first spiral on the second double-spool and also for guiding said band material from the second spiral on the first double-spool onto a second spiral on the second double-spool, the said band-supporting guide members being re-positioned, in the second said positions of the movable guide system, for guiding said band material from the said second spiral on the second double-spool to the said fixed station and from the fixed station onto a second spiral on the first spool and also for guiding said band material from the first spiral on the second double-spool to a first spiral on the first double-spool.

3,981,572
MIRROR FOLLOW-UP DEVICE FOR A FILM PROJECTOR

Jean-Jacques Bessire, and Francis Loardon, both of Bern, Switzerland, assignors to Eresa S.A., Bern, Switzerland

Filed Sept. 23, 1974, Ser. No. 508,616
Claims priority, application Germany, Sept. 24, 1973, 2347931
Int. Cl.² G03B *41/10*
U.S. Cl. 352—112 **7 Claims**



1. A mirror follow-up device for a projector intended to project a path of light rays of a continuously movable film upon an image plane, comprising:

a plurality of mirrors and a like number of mirror supports;

a plurality of ball and socket joints about each of which one of said mirrors is pivotable on one of said mirror supports;

a supporting base;

a bearing axle connected to said supporting base and having two parallel and staggered shaft portions;

a plate rotatingly mounted on one of said shaft portions;

a mirror wheel rotatingly mounted on the other of said shaft portions, said mirrors being attached to said mirror wheel through said mirror supports and said ball and socket joints;

a plurality of coupling means corresponding to the number of said mirrors and being connected between said plate and said mirror wheel for transmitting the rotating motion of said plate to said mirror wheel; and

a plurality of extended guide shafts, each of said guide shafts being connected adjacent one end thereof with a respective one of said ball and socket joints; and wherein

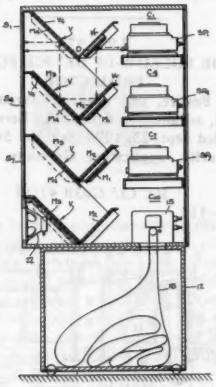
each of said coupling means comprises a sliding block disposed perpendicular to said bearing axle and having an elongated recess therein, a slide displaceable within said recess for supporting a respective one of said guide shafts, an eccentric disc rigidly connected to said plate, a roller rotatingly mounted at the free end of said respective one of said guide shafts and cooperating with said eccentric disc, and a spring for pressing said roller against said eccentric disc, whereby said respective one of said guide shafts is pivoted about an axis which is substantially perpendicular to a plane defined by the path of rays emanating from said projector.

3,981,573

AUDIO-VISUAL SLIDE PROJECTION SYSTEM

Robert C. Schwartz, Woodmere, N.Y., assignor to Motiva, Ltd., New York, N.Y.

Filed July 29, 1975, Ser. No. 600,000
Int. Cl.² G03B *21/22, 21/00*
U.S. Cl. 353—15 **9 Claims**



1. A multiple slide projection system comprising:

A. a vertical array of individual slide projectors, each including a projection lens having a horizontal optical axis, a supply of slides and an indexing mechanism to transfer slides successively from the supply to an optical path leading to the projection lens for projection of slide images along said axis;

B. a vertical array of co-planar rear view screen sections to form a mosaic screen matrix adjacent the array of projectors, each section of the matrix lying in the vertical plane and being associated with a corresponding projector on the same level to present the slide image projected by said corresponding projector;

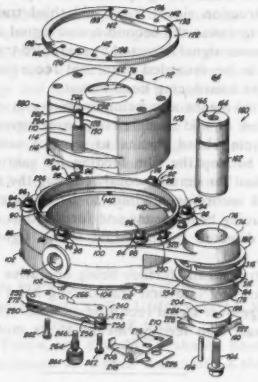
C. an upright V-shaped reflector assembly interposed between each screen section and its corresponding projector on the same array level, said each same-level assembly having an inclined front leg which faces the screen section and a reversely-inclined rear leg which faces the projection lens of the corresponding projector, each said front and rear leg of each assembly having mirrors on the upperside and the underside thereof, each said assembly being positioned in the optical axis of each projector and screen section so that the underside mirror on the rear leg receives an image from the lens and directs it downwardly onto the upperside mirror on the rear leg of the V-shaped reflector assembly on the level below, which mirror directs the image forwardly toward the upperside mirror on the front leg of the level-below assembly, which mirror directs the image upwardly onto the underside mirror on the front leg of the same-level assembly, which mirror in turn projects the image onto the assoicated screen section, whereby the opitical path between each lens and each screen section is substantially longer than the straight line distance therebetween.

3,981,574

OPTICAL DEVICE

Alexander Jesensky, Barrington; Frederick D. Meller, Lombard; Robert C. Patzke, Prospect Heights, and Gilbert W. Willey, Barrington, all of Ill., assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Dec. 17, 1973, Ser. No. 425,511
Int. Cl.² G03B *3/00*
U.S. Cl. 353—101 **16 Claims**



1. A device for providing a projected image of a micro-image comprising

an elongated illumination path,

means for positioning said micro-image in said illumination path,

means for illuminating said micro-image to form said projected image of said micro-image having a first spatial disposition or image position in an image plane,

optical means for receiving said projected image and for variably optically altering the spatial disposition or image position of said projected image in said image plane from said first spatial disposition or image position to a second, distinct, spatial disposition or image position in said image plane, said optical means including an axis of rotation,

a projection lens assembly disposed between said illuminating means and said optical means, and

means for mounting said optical means along said illumination path in a position to receive said projected image from said projection lens assembly, said mounting means including means for variably adjusting the longitudinal position of said optical means along a portion of said elongated illumination path and means for enabling the movement of said optical means into and out of said illumination path, said enabling means including a stationary member providing a fulcrum or pivot point about which the optical means is pivotably movable into and out of the illumination path and said mounting means including means for impeding the pivotal movement of said

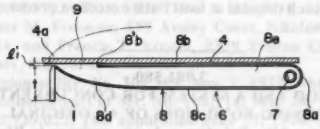
optical means when said axis of rotation is substantially coincident with the longitudinal axis of said illumination path.

3,981,575

PHOTOCOPIER ILLUMINATION DEVICE

Susumu Tanaka, Sakai; Yuji Enoguchi, Osaka; Masaya Ogawa, Sakai; Hidetoshi Kawabata, Tondabayashi; Takaji Kurita, Kawachinagano; Takao Fujiwara, Sakai; Hiroshi Murasaki, Sakai, and Kenichi Wada, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed June 3, 1975, Ser. No. 583,391
Claims priority, application Japan, June 22, 1974, 49-71518
Int. Cl.² G03B 27/00, 15/28, 15/32
U.S. Cl. 355—1 25 Claims



1. An optical illumination device for use in a copying apparatus of the type wherein an object is to be illuminated and an image thereof is to be projected through a particular image transmitter formed of a plurality of optical fibers of graded refractive index in bundled configuration to a light sensitive surface, said device comprising: an illumination light means; and

a light guide duct having the shape of a substantially flattened cubic body supported within the machine housing below a transparent support structure for the support of the object thereon, said light guide duct comprising top and bottom reflective surfaces in spaced relation to each other, a pair of opposed side reflective surfaces extending between said top and bottom reflective surfaces in spaced relation to each other, and an end reflective surface at one end of said light guide duct closing the end thereof, said bottom reflective surface being greater in length than said top reflective surface and having a portion thereof adjacent the other end of said light guide duct upwardly curved, said upwardly curved portion of said bottom reflective surface terminating adjacent the light receiving area of the image transmitter and providing a light exit in cooperation with the free end of said top reflective surface,

said light means being accommodated within said light guide duct and held in position adjacent said end reflective surface, rays of light from said light means to travel towards said curved portion of said bottom reflective surface and, after having been reflected by said curved portion of said bottom reflective surface, further travel towards the object through said light exit.

3,981,576

MULTICOLOR ELECTROPHOTOGRAPHIC COPIER WITH LIQUID DEVELOPING

Shozo Inoue, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1974, Ser. No. 463,161
Claims priority, application Japan, Apr. 24, 1973, 48-46484
Int. Cl.² G03G 15/01
U.S. Cl. 355—4 9 Claims

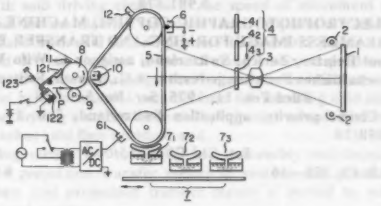
1. An electrophotographic copying apparatus comprising:

a rotatable image bearing member;

means for successively forming on said image bearing member electrostatic latent images of respective color components of an original in a predetermined spaced-apart relationship, thereby defining non-image bearing portions on said image bearing member between said successive images;

means for maintaining said non-image bearing portions of said image bearing member at a potential of a predetermined polarity;

developing means for applying different color charged developers to said image bearing member, said charged developers having a polarity opposite to said predetermined polarity, and each said developer comprising toner particles suspended in developing liquid, said developer



means including a plurality of developing units, one for each said different color developer, disposed below said image bearing member for applying the developers individually to the respective latent images, wherein excess toner particles are attracted to said non-image bearing portions thereby avoiding mixing of the developers;

means for transferring the images thus developed onto a transfer material in a superimposed relationship; and

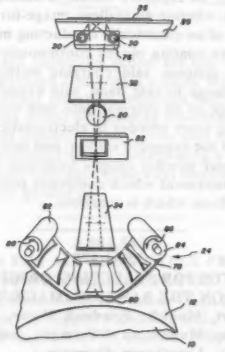
means for cleaning said image bearing member after transfer of the images.

3,981,577

OPTICAL SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

George N. Tsilibes, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 18, 1974, Ser. No. 507,169
Int. Cl.² G03G 15/30
U.S. Cl. 355—4 5 Claims



1. An optical system for forming a substantially uniform intensity light image of an original document, including:

a light source for illuminating the original document with light rays;

lens means in a light receiving relationship with the light rays transmitted from the original document to form a light image thereof;

an opaque belt member having a plurality of spaced slits therein, each of the slits in said belt member being of

different areas and having the widths thereof increasing in a lengthwise direction from a central region to the marginal regions thereof;

means for movably supporting said belt member; and

means for moving said belt member so as to position one of the slits in the optical path of the light image to correct the non-linearities of the light image transmitted thereto so as to transmit therefrom a light image having substantially uniform intensity.

3,981,578

ELECTROPHOTOGRAPHIC COPYING MACHINE WITH SEAMLESS IMAGE FORMING AND TRANSFER BAND

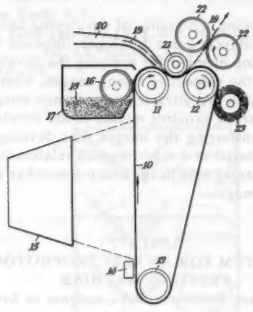
Paul Heinzer, Zurich, Switzerland, assignor to Wifo Wissenschaftliches Forschungs-Institut A.G., Zurich, Switzerland

Filed Feb. 11, 1975, Ser. No. 549,048

Claims priority, application Switzerland, Feb. 11, 1974, 1858/74

Int. Cl.² G03G *15/00*

U.S. Cl. 355—16 **6 Claims**



1. In an electrophotographic copying machine including a charging station, an exposure station, a dusting station, and a transfer station, wherein an endless, image-forming and transfer band made of an electrically conducting material having a photoconductive coating moves continuously and in succession past said stations, said charging station imparting an electrostatic charge to said band, said exposure station projecting an image of an original onto said band, said dusting station applying toner powder to electrostatic images formed on said band at the exposure station, and said transfer station transferring toner powder images from said band to a copy sheet, the improvement which comprises providing said endless band in a form which is seamless.

3,981,579

APPARATUS FOR SELECTING ORIGINALS FOR COPYING ON THE BASIS OF IMAGE SHARPNESS

Volker Weinert, Munich; Friedrich Hujer, Grunwald, and Walter Knapp, Munich, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

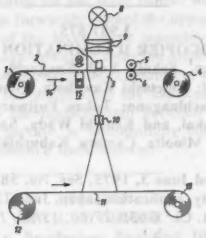
Filed Sept. 7, 1973, Ser. No. 395,366

Claims priority, application Germany, Sept. 9, 1972, 2244340

Int. Cl.² G03B *27/00*

U.S. Cl. 355—18 **17 Claims**

1. In an arrangement for copying originals, an arrangement for selecting originals to be copied on the basis of the sufficiency of the image sharpness of such originals, comprising, in combination, a copying station having means for copying an original; means for monitoring the rate of change of density across each original; and means for automatically preventing copying of an original unless the monitored rate of change of



density of such original at least once exceeds a predetermined reference value.

3,981,580

METHOD AND A SYSTEM FOR CONCURRENTLY COPYING BOTH SIDES OF AN ORIGINAL

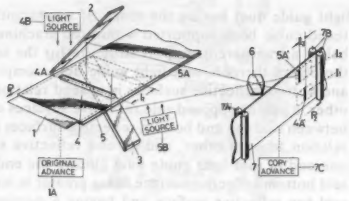
Hajime Yamashita, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1974, Ser. No. 521,146

Claims priority, application Japan, Nov. 12, 1973, 48-126218

Int. Cl.² G03B *27/32*, *27/52*

U.S. Cl. 355—24 **15 Claims**



1. A system for concurrently copying both sides of an original having a selected length and a selected width onto the same side of a copy having a selected length and a selected width comprising:

a first and a second opaque plate overlapping each other and spaced dfrom each other by a small distance to allow the original to pass therebetween in an original scanning direction which is parallel to the length of the original, each plate having an elongated transparent window transverse to the original scanning direction and the windows being spaced from each other along the original scanning direction by a distance which is less than the length of the original;

means defining a passageway through which the copy moves in a copy scanning direction which is parallel to the length of the copy;

means for forming a reflected light image of the portions of the original scanned by said windows as the original moves in said original scanning direction; and

means for scanning adjacent areas of the same side of the copy with said reflected light image as the copy moves along said copy scanning direction, said adjacent areas being side-by-side across the width of the copy and being coextensive along the length of the copy.

11. A method of concurrently copying both sides of an original onto the same side of a copy comprising the steps of:

scanning a first side of the original with a first incident beam and a second side of the original with a second incident

beam to thereby provide a first and a second reflected beam, each of said incident beams being elongated in a direction transverse to the original scanning direction and the locations on the original where said incident beams impinge being spaced from each other along the scanning directions by a distance which is less than the size of the original in the scanning direction; and

scanning, in a copy scanning direction, a first and a second area of the copy, which are on the same side of the copy and are spaced from each other along a direction transverse to the copy scanning direction, with said first and second reflected beam respectively to thereby form thereon a first and a second copy image of the portions of the original scanned by said first and second incident beam respectively.

3,981,581

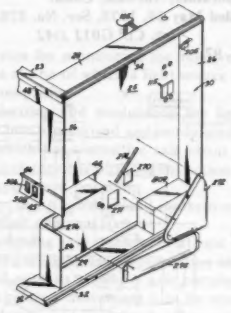
DRIVE SYSTEM FOR SHIFTING A MIRROR ASSEMBLY

Lawrence M. Freeman, 599 Ansley Court, NE., Atlanta, Ga. 30324, and Francis T. Arnold, 2379 Tristan Circle, NE., Atlanta, Ga. 30345

Division of Ser. No. 304,519, Nov. 7, 1972, which is a continuation-in-part of Ser. No. 146,114, May 24, 1971, Pat. No. 3,730,622. This application June 17, 1974, Ser. No. 479,879

Int. Cl.[2] G03B *13/24*

U.S. Cl. 355—44 4 Claims



1. In a microfilm reader-printer apparatus for copying images from microfilm onto copy paper including image forming means for reproducing the image of the microfilm on the copy paper and a viewing sceen, the improvement comprising:

image projection means for projecting the image from the microfilm into said image forming means to cause the image to be reproduced on said copy paper;

projection transfer means for selectively transferring the projected image from said image projection means onto said viewing screen while preventing said projected image from reaching said image forming means when said projection transfer means is in a first position and for allowing said projected image to reach said image forming means when said projection transfer means is in a second position, said projection transfer means constructed and arranged to be constantly urged toward said first position;

a drive motor having a rotary output shaft;

a driving member carried by and rotatable with said output shaft;

a flexible endless transfer member connected to and moved by said driving member along a prescribed path in a first direction;

a driving element mounted on and movable with transfer member along said prescribed path;

a first driven element operatively connected to said projection transfer means; said first driven element constructed and arranged to be engaged by and moved with said driving element at the speed of movement of said driven element to move said projection transfer means from said first position to said second position as said driving element is moved along a first predetermined portion of said prescribed path in said first direction by said transfer member and for releasing said first driving element when said projection transfer means reaches said second position;

a second driven element operatively connected to said projection transfer means; said second driven element constructed and arranged to be engaged by and moved with said driving element at the speed of movement of said driven element to move said projection transfer means from said second position to said first position as said driving element is moved along a second predetermined portion of said prescribed path in said first direction by said transfer member and for releasing said second driving element when said projection transfer means reaches said first position; and,

holding means for resiliently and releasably maintaining said projection transfer means in said second position when said projection transfer means is moved to said second position.

3,981,582

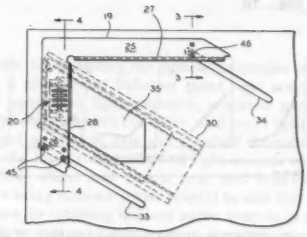
MICROFILM COPYBOARD WITH DOCUMENT INDEX

George William Bookless, Franklin Park, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sept. 30, 1975, Ser. No. 617,471

Int. Cl.[2] G03B *27/62*

U.S. Cl. 355—75 10 Claims



1. A copyboard especially suited for use in a microfilm system, said copyboard comprising a guide member having a digital display means integrally mounted thereon, and guide member mounting means for enabling movement of said guide member and said display means across said copyboard, said guide member mounting means commprising a main guideway and spaced parallel outrigger guideways disposed on opposite sides of said main guideway.

3,981,583

APPARATUS FOR AUTOMATICALLY PROCESSING PHOTOPOLYMER PLATES

Shozo Tsuchida, Kawashishi, and Sakuo Okai, Joyoshi, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

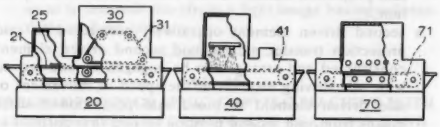
Filed Aug. 23, 1973, Ser. No. 390,874

Int. Cl.[2] G03B *27/30*

U.S. Cl. 355—100 7 Claims

1. An apparatus for processing plates having a photopolymer surface comprising: an exposure unit having a first conveyer for carrying said plates, a transparent photographic image conveyer alignable with said first conveyer and movable in the same direction as said first conveyer, and a light source adapted to pass light through said transparent photographic image conveyer for exposing portions of said photopolymer surface; a washing unit having a net conveyer adapted to continuously receive said plates from said first conveyer, and

nozzle means directed at said net conveyer, for spraying wash-out liquid on said plates to wash away the unexposed portions of said photopolymer surface, said nozzle means disposed above and at right angles to the plane of said net conveyer and operable in reciprocating motion perpendicular to the direction of movement of said plates; and a drying unit having a



second conveyer adapted to continuously receive said plates from said net conveyer, and means for drying said plates carried by said second conveyer, said drying means including hot air blowers, infrared heating tubes and mercury lamps directed at said plates whereby plates are continuously processed for letter-press printing.

3,981,584

PREDICTION OF ENGINE FAILURE BY EXAMINATION OF PARTICLE SIZE DISTRIBUTION OF METAL PARTICLES IN LUBRICANT

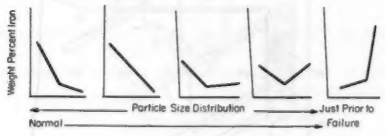
Jon Anthony Guymer, Beaumaris, Australia, assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,762

Claims priority, application Australia, June 13, 1974, 7878/74

Int. Cl.² G01N *33/28, 15/02*

U.S. Cl. 356—70 6 Claims



1. A method for predicting incipient failure of an apparatus having moving metal surfaces, which surfaces are wetted with a liquid lubricant which comprises separating the metal wear particles contained in a sample of said lubricant into at least three predetermined size ranges by passage through membranes having pore openings corresponding in size to said predetermined size, analyzing each of the fractions so separated for a selected metal contaminant, plotting the content of said metal contaminant for each of said fractions against the particle size thereof and determining the likelihood of mechanical failure in said apparatus from the shape of the resulting graph.

3,981,585

MOLECULAR CAVITY ANALYSIS-FILTER CAVITY

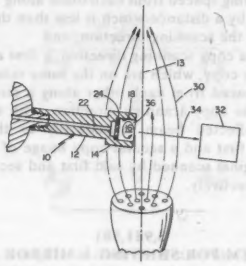
Ronald Belcher; Alan Townshend, and Stanley L. Bogdanski, all of Birmingham, England, assignors to Anacon, Inc., Ashland, Mass.

Continuation-in-part of Ser. No. 389,587, Aug. 20, 1973, Pat. No. 3,871,768. This application Feb. 3, 1975, Ser. No. 546,197

Int. Cl.² G01J *3/30*

U.S. Cl. 356—87 4 Claims

1. In an emission promoting structure for use in an analyzer in conjunction with a flame and an optical emission analysis device, said structure defining a sheltered region for containing reactant, an exposure path for flame gas to interact with the reactant in the sheltered region and an optical path projecting out of said sheltered region whereby, under conditions influenced by said structure, reactant vapor in said sheltered region and flame gas can mix, interact and emit along said optical path to said analysis device radiation characteristic of said interaction, the improvement wherein said emission promoting structure is defined by a filter and sheltering wall



means extending from said filter to an opening, said wall means sheltering said filter from said flame, and said opening and wall means defining said exposure path for gas from the flame to interact with reactant provided on said filter.

3,981,586

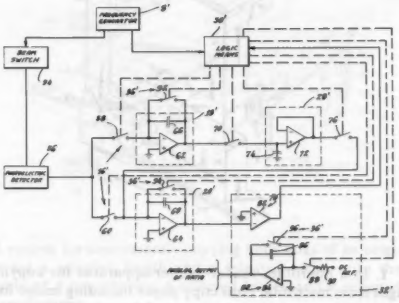
CONTINUOUSLY MONITORING RATIOMETER

Larkin B. Scott, Forth Worth, Tex., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 19, 1975, Ser. No. 578,500

Int. Cl.² G01J *3/42*

U.S. Cl. 356—97 10 Claims



1. Apparatus for continuously monitoring a ratio between two time-varying signals, comprising:

a first integrator for the signal relating to the denominator of the ratio;

a second integrator for the signal relating to the numerator of the ratio;

chopper means for applying each of the signals to said corresponding integrator;

sample and hold means for storing the output of said first integrator; said sample and hold means having the output thereof connected to the input of said second integrator;

timer means for measuring the elapsed interval between when output from said sample and hold means is applied to said second integrator and when output from said second integrator transgresses through a reference level;

reset means for returning said timer means and each said integrator to reference levels;

a frequency generator; and

logic means for controlling said chopper means, the output from said sample and hold means, and said reset means in synchronized intervals with the cycles of said frequency generator, said chopper means being controlled to apply the signals to said integrators for at least one frequency cycle, the output from said sample and hold means being controlled for connecting to said second

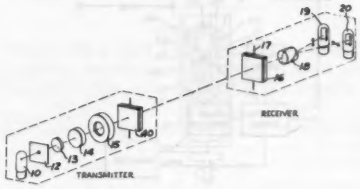
integrator only after integration of the numerator signal has been completed thereby, and said reset means being controlled to establish the reference levels only after the elapsed interval in proportion to the ratio of the signals has been measured by said timer means.

3,981,587

MONITORING RELATIVE DISPLACEMENT BETWEEN TWO DEVICES

John G. Gievers, Rochester, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 17, 1962, Ser. No. 245,320
Int. Cl. G01b 11/26
U.S. Cl. 356—152 36 Claims



32. An apparatus for monitoring the relative position between two points at one of which a light source is positioned, said apparatus comprising

means for polarizing and modulating the light from said light source into a polarized and modulated beam,

a transducer which has a sensitive axis about which it may be rotated to change the birefringent action thereof from an initial birefringent position,

said transducer being substantially insensitive to rotations about any other coplanar axis,

means for positioning said transducer at said second point in the path of said light beam for rotation about its sensitive axis and with its sensitive axis parallel to the axis about which relative movement is to be monitored,

means for analyzing said light beam after passage through said transducer for changes in polarity thereof due to rotation of the transducer about its sensitive axis relative to the beam,

a second transducer positioned in the path of the light beam with its sensitive axis at an angle to the sensitive axis of the first transducer,

and second analyzer means for analyzing the change in polarity of said light beam due to the rotation of said second transducer.

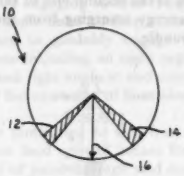
3,981,588

MEANS AND METHOD FOR DETERMINING MERIDIAN LOCATION AND AZIMUTH

Theodore E. Wirtanen, Chelmsford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 5, 1974, Ser. No. 494,936
Int. Cl.² G01B 11/26; G01C 17/34
U.S. Cl. 356—152 4 Claims

1. A system for determining meridian location comprising: a means for observing stellar events; a rotatable support means adopted to receive the stellar event observing means; means for selectively rotating said support means in a level plane; means connected to the observing means for timing, and recording sequential intervals of the passage of a stellar object relative to at least two fixed apertures in said observing means; means for determining a ratio between timed sequential intervals; means for converting the ratio into an electrical signal; and means connected to the support rotating means for



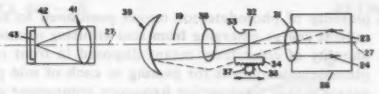
rotating said support until determined ratios for subsequent sequential stellar events reach a minimum.

3,981,589

AUTOMATIC OBJECTIVE LENSOMETER

Larry Spitzberg, San Rafael, Calif., assignor to Optical Sciences Group, San Rafael, Calif.

Filed Oct. 30, 1974, Ser. No. 519,092
Int. Cl.² G01B 9/00
U.S. Cl. 356—127 11 Claims



1. A device for analyzing the optical properties of a lens, comprising a plurality of Scheiner point light sources with electrically controlled light intensity, actuated periodically and out of phase each with the other, said point light sources arrayed about an optical axis and directed therealong; first rotating means supporting said point light sources and selectively rotatable about said optical axis; said Scheiner point light sources being stationary with respect to said first rotating means; means for retaining the lens under analysis in the path of the rays from said point light sources; target aperture means disposed between said point light sources and said retaining means and translatable along said optical axis; telescope means for focusing said rays passing through the lens; light transducer means disposed at the focal plane of said telescope means for generating an electrical signal in proportion to the illumination from the target images from said point light sources falling thereon; electrical circuit means for processing said electrical signal and determining the relative alignment and convergence of said images; second rotating means for supporting said light transducer means and rotating same about said optical axis in concert with said first rotating means.

3,981,590

OPTICAL SYSTEM TO OPTIMIZE FIELD OF VIEW UNIFORMITY IN A MULTI-COLOR PRODUCE SORTER

Joseph R. Perkins, Burke, Va., assignor to AMF Incorporated, White Plains, N.Y.

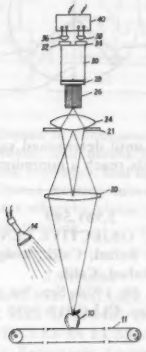
Filed Aug. 28, 1975, Ser. No. 608,497
Int. Cl.² G01J 3/50
U.S. Cl. 356—178 9 Claims

1. In apparatus for grading articles of agricultural produce according to frequency components of radiant energy received therefrom, the combination comprising

objective lens means for focusing at an image plane radiant energy received from an object to be graded,

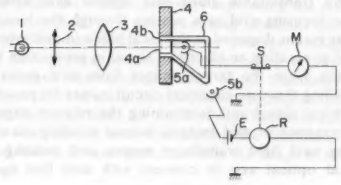
a field stop at or near said image plane for defining a field of view that includes an article to be graded,

a fiber optic bundle having first and second ends,
field lens means adjacent said stop for forming an image onto one end of said fiber optic bundle,
diffusing means at the second end of said bundle for diffusing radiant energy emerging from the other end of said fiber optic bundle,



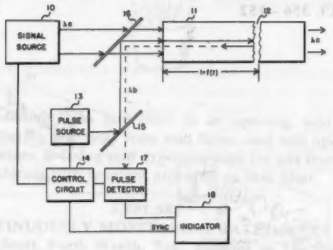
a plurality of photodetector means positioned to receive radiant energy emerging from said diffusing means, and
a plurality of color filter means disposed in front of said photodetector means for passing to each of said photodector means a respective frequency component of said radiant energy.

3,981,591
AUTOMATIC PHOTOMETER
Kazuo Mimura, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan
Continuation-in-part of Ser. No. 392,862, Aug. 30, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,808
Claims priority, application Japan, Sept. 4, 1972, 47-87929
Int. Cl.² G01N *21/22*
U.S. Cl. 356—201 **11 Claims**



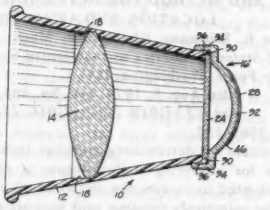
1. An automatic photometer for metering intensity of light from a portion of a sample to be measured, said photometer comprising a light source for illuminating the sample,
an objective for forming the image of the sample illuminated by the light source,
a stop plate formed with an aperture at the focusing plane of the objective for passing light therethrough,
a first photo-electric conversion means for receiving the light passed through the aperture of said stop means,
means for indicating an output signal from said first photo-electric conversion means, and
control means for allowing the indicating of said indicating means, only when the image of said portion of the sample to be measured is completely within said aperture,
whereby said indicating means indicates only the output signal from said first photo-electric conversion means when the image of said portion to be measured is completely within said aperture.

3,981,592
SYSTEM FOR LOCATING BREAKS IN FIBER OPTIC FILAMENTS
Donald N. Williams, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Mar. 31, 1975, Ser. No. 563,751
Int. Cl.² G01N *21/16*; G01C *3/08*
U.S. Cl. 356—237 **6 Claims**



1. A system for locating breaks in fiber optic filaments transmitting light energy signal information from a first source comprising:
a second source of light energy pulses having a frequency distinguishably different from said light energy signal information;
means for directing said pulses along the light paths defined by the disposition of said fiber optic filaments;
a control circuit for controlling the emission of said pulses from said second source at a determinable time;
a pulse detector positioned to receive reflected pulse light energy from said fiber optic filaments; and
an indicator responsive to said control circuit and said pulse detector for indicating the elapsed time between the emission of said pulses and the reception of said reflected pulse light energy, whereby to establish the total distance along said light path to the location of breaks in said fiber optic filaments including curvilinear distances due to said disposition of said fiber optic filaments.

3,981,593
SOFT CONTACT LENS INSPECTION DEVICE
Robert M. Boyle, 2655 Tokola St., Concord, Calif. 94518
Filed Feb. 27, 1975, Ser. No. 553,476
Int. Cl.² G01N *21/04*
U.S. Cl. 356—239 **12 Claims**



1. A soft contact lens inspection device, comprising:
a housing;

a magnifying lens mounted within said housing;

a transparent concave-convex contact lens supporting member at the top of said housing; said supporting member having the concave surface thereof facing said magnifying lens; and

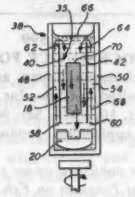
a soft contact lens on the convex surface of said supporting member for inspection thereof.

3,981,594

OPTICAL ABSORPTION CELL WITH MAGNETIC STIRRING

Kenyon Palmer George, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 1, 1975, Ser. No. 618,410
Int. Cl.² G01N *1/00*
U.S. Cl. 356—246 6 Claims



1. An optical absorption cell for use in optical absorption spectroscopy, comprising:

a container for fluidic samples to be subjected to optical absorption;

a magnetic stirrer body at the bottom of said container, said body being rotatable in response to an externally applied rotating magnetic field, for effecting agitation of said sample; and

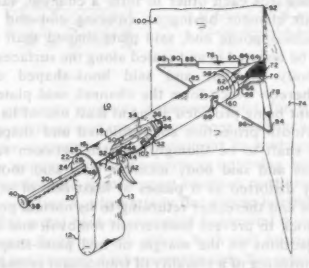
partitioning means mounted in said container in non-interfering relationship to the anticipated light projection path through said container; said partitioning means defining in cooperation with the rotation of said stirrer body an upward flow space adjacent the walls of said container, and a downward flow space toward the interior of said container; said partitioning means extending at least to a level in said sample above the said light projection, whereby relatively complete agitation of said fluidic sample is effected at least in the portions of said sample residing within said light projection path.

3,981,595

DISPENSING PAINT TRIMMER

Theodore M. Blake, 801 Farley Drive, Huntsville, Ala. 35802

Filed May 27, 1975, Ser. No. 580,550
Int. Cl.² A46B *11/00*
U.S. Cl. 401—48 2 Claims



1. A dispensing paint trimmer for painting one of two walls meeting along a line at a right angle comprising:

a right angle frame, and first and second spaced guide members comprising first and second rollers supported on said frame on perpendicular axes, and each roller having a linear outer wall engaging surface lying along a line 90° apart from the same outer surface of the other roller and thereby adapted to guidably engage surfaces of such walls, said frame including an open region between said second roller and right angle at and corresponding to the intersection of the extension of lines along said surface of said rollers;

a paint dispenser connected to said frame, and having an outlet and paint feed control means for supplying a selected quantity of paint through said outlet; and

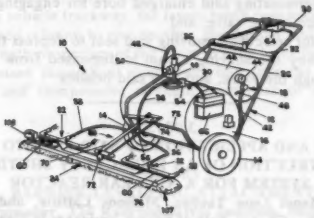
paint distribution means comprising a plurality of bristles extending from said outlet of said paint dispenser, the ends of said bristles comprising a paint application area extending from said right angle for a selected distance in said open region and along a line which, when extended, engages said outer surface of said second roller.

3,981,596

FLOOR FINISH APPLICATOR

Joseph E. Melton, Grand Rapids, Mich., assignor to Melton Systems, Inc., Grand Rapids, Mich.

Continuation-in-part of Ser. No. 432,098, Jan. 9, 1974, abandoned. This application June 30, 1975, Ser. No. 591,850
Int. Cl.² A46B *11/02*
U.S. Cl. 401—48 25 Claims



1. A floor finish applicator comprising:

frame means adapted for movement along a floor in any selected direction;

liquid finish storage tank means mounted on the frame means, said storage tank means having an inlet and an outlet and being adapted to hold liquid finish therein;

finish spreading means adapted to spread the finish out into a smooth, even finish after it has been applied to the floor, said finish spreading means being mounted in the applicator for transverse movement with respect to the frame as the frame moves in its selected direction in applying finish to the floor, said transverse movement being sufficient to permit the finish spreading means to follow a path along the floor that deviates from the path followed by the frame so as to permit the application of finish around obstacles and corners in a room as the frame is moved past such obstacles and corners; and

finish applying means for receiving liquid finish from the outlet of the storage tank and applying liquid finish to the floor in the path of the finish spreading means as the applicator is moved along the floor.

3,981,597

SHAVING CREAM DISPENSER

Bernard Cohn, 100 Princeton Ave., Bridgeton, N.J. 08302

Filed May 28, 1975, Ser. No. 581,643
Int. Cl.² A46B *11/02*
U.S. Cl. 401—190 6 Claims

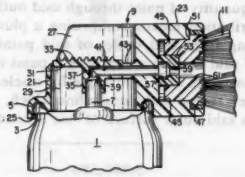
1. A lather dispensing shaving brush for attachment to a cylindrical aerosol can having an outwardly extending flange

surrounding its top surface and an axially movable cylindrical valve on its top surface, the depression of which dispenses shaving cream through the valve comprising:

a housing;

an inwardly extending lip on said housing of smaller diameter than said flange for removably engaging said flange;

a base having outer and inner surfaces, said outer surface having bristles embedded therein and said inner surface having a cavity formed therein for receiving a nozzle member, said base being removably mounted in said housing;



a duct formed in said base having one end opening into said outer surface and its other end opening into said cavity;

a foam producing nozzle member disposed in said base cavity having an orifice concentric and communicating with said other end of said duct;

an enlarged bore connected to said orifice for slipping over the valve;

a seat terminating said enlarged bore for engaging the top surface of the valve; and

means for selectively moving said seat to depress the valve, whereby the shaving cream is dispensed from the can, through the valve, and into said bristles.

3,981,598

FUSE AND APPLICATION OF SAID FUSE TO THE CONSTRUCTION OF AN EMERGENCY SHUTDOWN SYSTEM FOR A NUCLEAR REACTOR

Hubert Henri Leon Taulier, Maisons Laffitte, and Gerard Brugeilles, Chatou, both of France, assignors to Electricite de France (Service National), Paris, France

Filed May 14, 1974, Ser. No. 469,907

Claims priority, application France, May 22, 1973, 73.18496

Int. Cl.[2] F16D 9/00

U.S. Cl. 403—28 **7 Claims**

1. A coupling device or fuse between two components of elongated shape, said coupling being capable of breaking if a given physical characteristic of the space in which said device is located exceeds a predetermined threshold value, wherein said device comprises a first element for providing a mechanical connection between the two components, said element being formed of material which retains its mechanical properties when said physical characteristic is below the threshold value, and a second element formed of material which melts when said characteristic attains said threshold value and causing when in contact with the material of the first element an exothermic reaction with said material producing a temperature which is higher than the melting point of the material of the first element and also the formation of any alloy would be such as to have a melting point below said threshold value, means included in said coupling for separating the first element from the second element when said characteristic is below said threshold value and allowing engagement of said materials with each other after melting of the material constituting the second element.

3,981,599

PUSH-PULL-LOCK DEVICE FOR SLIDE SHAFT

Toshiharu Koen, Yokohama, Japan, assignor to Victor Company of Japan, Limited and Nifco Inc., both of Tokyo, Japan

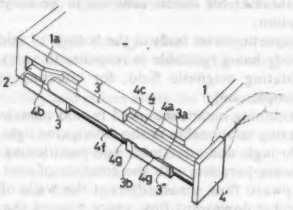
Filed Oct. 10, 1974, Ser. No. 513,789

Claims priority, application Japan, Oct. 11, 1973, 48-117446

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.[2] F16B 7/10; F16D 1/12

U.S. Cl. 403—107 **3 Claims**



1. A plastic device having locking means thereon to control the sliding of a plate-shaped shaft element relative to a body on which it is mounted comprising a plate-shaped shaft member, a second body member having a plurality of hook-shaped shaft guide pieces mounted along a surface on which said plate-shaped shaft member is mounted, said body member being made of an appropriate resilient plastic material, said shaft guide pieces being disposed alternately along the margins of said body member in confronting but staggered positions, said hook-shaped shaft guide pieces including upright elements and at their terminal ends in spaced relation to said body member having lips also in confronting position and extending towards each other to form a channel, said plate-shaped shaft element having an entering end and a catch surface on its opposite end, said plate-shaped shaft element adapted to be inserted in and sealed along the surfaces formed by said body member and said hook-shaped elements mounted thereon which form the channel, said plate-shaped shaft element being provided along at least one of its margins with a sawtooth projection so positioned and shaped as to permit the shaft to be slidingly inserted between said shaft guide pieces and said body member with said tooth being temporarily distorted as it passes at least one of said guide shaft pieces and thereafter returning to its normal position to provide a lock to prevent inadvertent removal, and a second set of projections on the margin of said plate-shaped shaft member consisting of a plurality of trapezoidal projections for frictional interference with the hook-shaped guide piece elements to permit positionment of said plate-shaped shaft element in any desired predetermined position.

3,981,600

KEY RETAINING DEVICE

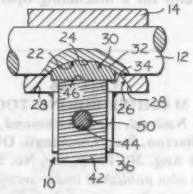
Charles F. A. Laitner, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 13, 1975, Ser. No. 540,632

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² F16B 3/00

U.S. Cl. 403—318 3 Claims



1. A key retaining device comprising,

an elongated shaft with a notch formed therein,

a tubular member fully encirclingly journalled on said shaft and having a radial slot extending through the outer periphery thereof with closing end walls formed therethrough alignable with said notch,

a pair of ears secured to the outer periphery of said tubular member in radially outwardly extending relation on opposite sides of said slot,

a key insertable in said notch and in said slot to lock said shaft and said tubular member together,

a key retaining plate radially inwardly disposable against said key, and

fastener means operatively associated with said ears to deflectably bias them together for clamping the key retaining plate therebetween, maintaining said key in its locked condition and for transferring force across said slot in said tubular member.

3,981,601

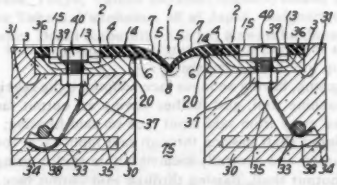
EXPANSION JOINT AND METHOD OF INSTALLING THE SAME

Mctonosuke Arai, 4-12, Iwazono-cho, Ashiya, Hyogo, Japan

Continuation of Ser. No. 361,024, May 17, 1973, abandoned. This application Mar. 20, 1975, Ser. No. 560,481

Int. Cl.² E01C 11/02

U.S. Cl. 404—68 5 Claims



1. A concrete roadway expansion joint for spaced apart roadway portions said roadway portions each including means to anchor a roadway expansion joint to said roadway, said roadway expansion joint comprising opposing horizontal fixing bodies for said spaced apart roadway portions; said fixing bodies including a substantially flat elastic horizontal course; a hard flat metal base course; said horizontal course and said base course fused to each other, both said horizontal course and said base course each approximately the same width over said roadway portions, an elastic expansion plate, said metal base course including a fillet and said elastic horizontal course including a rib over said fillet adjacent said expansion plate being integral with said horizontal fixing bodies for said spaced apart roadway portions; said expansion plate extending below and away from the upper plane of said spaced apart fixing bodies between said apart roadway portions when on said spaced apart roadway portions; said expansion plate including a longitudinal groove along its upper surface, a thick apex corresponding to said longitudinal groove; said apex being opposite said longitudinal groove along said expansion plate between said spaced apart roadway portions; said expansion plate tapering thinner toward said apex, and said fixing bodies including longitudinal stepped openings, each said stepped opening extending at least to said hard metal base course, said roadway's means to anchor a roadway expansion joint interactable to anchor said horizontal fixing body at said stepped openings below the plane of the top of said fixing body and said spaced apart roadway portions.

3,981,602

VEHICLE RETARDATION

Dennis H. Ogden, Wolverhampton, England, assignor to British Industrial Plastics Limited, England

Filed Mar. 19, 1974, Ser. No. 452,672

Claims priority, application United Kingdom, Mar. 23, 1973, 14107/73

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² E01C 7/00; C08J 9/00

U.S. Cl. 404—71 9 Claims

1. A vehicle deceleration bed comprising at least two layers of a non-resilient cured foam of an aminoplast resin material laid on a vehicle trackway, the layers being coextensive and in superposed relation to one another, the density and compressive strength properties of the foam in each layer being sensibly constant throughout said layer, but different from the density and compressive strength properties of any other layer.

3,981,603

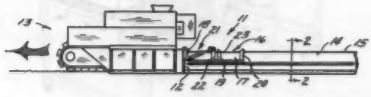
BARRIER LEVELLING ATTACHMENT

James Sprunger, 324 Railroad, Rives Junction, Mich. 49277

Filed Apr. 17, 1975, Ser. No. 569,077

Int. Cl.² E01C 19/52

U.S. Cl. 404—98 6 Claims



4. A barrier levelling attachment connected to a continuous barrier casting machine comprising:

an elongate smooth sided chute having an open top and bottom supported by said barrier casting machine and extending therefrom in continuing confinement of a barrier formed by said machine:

a frame supporting said chute and having plural spanning elements at spaced intervals along the length of said chute and confining the sides of said chute; and

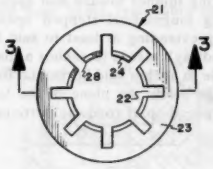
a pair of extendable adjustment struts, one on each side of said chutes and rigidly attached to said casting machine and extending therefrom and including a threaded extension member extending axially from said strut and threadably engaged therewith and attached by threaded means to said chute whereby said chute is adjustable as to elevation of one or both sides and lockable at said elevation.

3,981,604

LINER BUSHING

Thomas N. Cenis, Westfield, Mass., assignor to Joseph J. Mele, Huntington, N.Y.

Continuation of Ser. No. 499,452, Aug. 22, 1974, abandoned.
This application Dec. 10, 1975, Ser. No. 639,248
Int. Cl.² B23B 49/02
U.S. Cl. 408—72 B 9 Claims



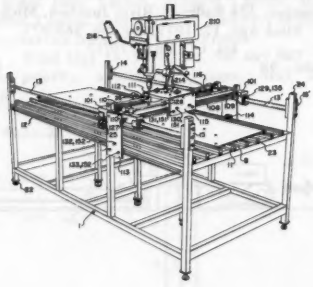
1. A liner bushing for holding a first member in alignment with respect to a second member to which said liner bushing is secured, said liner bushing being generally cylindrical and having an axial opening therethrough mating with said first member, a plurality of radially inwardly extending splines separated by a plurality of grooves in the peripheral surface of said opening, the inner extremities of said splines defining an alignment surface for said first member, the inner corners of said splines forming scraping edges whereby contamination on said first member is removed by twisting said first member in said bushing.

3,981,605

X-Y TABLE FOR MACHINING

Donald Edward Wirsing, Schaumburg, Ill., assignor to Frank Tessitore, Glenview, Ill.

Filed Nov. 3, 1975, Ser. No. 628,549
Int. Cl.² B23B 39/00
U.S. Cl. 408—88 28 Claims



1. Apparatus for coordinate positioning of a machining unit, wherein said apparatus comprises a frame assembly, a carriage unit, and a cross slide unit carrying said machining unit;

said frame assembly comprises a support structure with a work bed for receiving work pices for machining, two main shafts extending in a first direction, each main shaft having its two ends attached to said support structure, two first guide means parallel to said main shafts and mounted on and supported by said support structure;

said carriage unit comprises two end members, and two cross shafts extending in a second direction, each cross shaft having its two ends attached respectively to said two end members, each end member having main-shaft bearing means running on one of said main shafts and first moving support means running on one of said first guide means with a rigid structure between said main-shaft bearing means and said first moving support means;

said cross slide unit having two cross-shaft bearing means running respectively on said two cross shafts, and a bridge mounted between said cross-shaft bearing means to carry said machining unit;

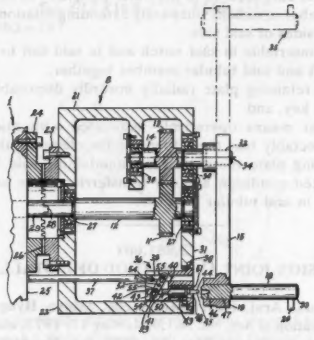
whereby the carriage unit may be accurately positioned along the main shafts, and the cross slide unit may be accurately positioned along the cross shafts, to locate the machining unit for a machining operation on the work piece.

3,981,606

MACHINE BORING TOOL

Robert Wilfred Nashold, New Richmond, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Aug. 30, 1974, Ser. No. 501,993
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² B23B 43/00
U.S. Cl. 408—124 5 Claims



1. In a machine tool utilizing interchangeable tool heads, the boring tool head comprising:

a. a housing, having an input face adapted to be received on a machine tool, and further having an output face disposed away from said input face on said housing;

b. an input shaft passing through said input face, rotatably mounted and centrally located within said housing;

c. an output shaft, passing through said output face, rotatably carried in said housing and displaced from said output shaft and drivingly connected thereto;

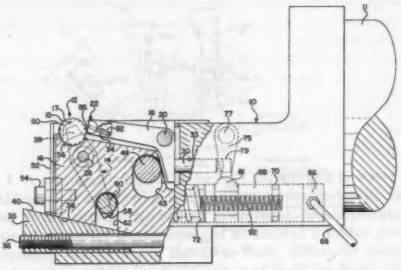
d. a boring arm, having one end connected to said output shaft and having the other end supporting a boring tool such that rotation of said output shaft causes said boring tool to swing in an arcuate path, wherein said arcuate path extends beyond the perimeter of said housing when viewed along the axis of said arcuate path; and

e. a latching mechanism affixed to said housing and operable to maintain said boring arm in a predetermined angular position while transporting said tool head to and from a tool head storage matrix, and further operable to automatically release said boring arm for free rotation when said tool head is employed for use at a machining site.

3,981,607
BORING BAR WITH REMOVABLE AND INDEXABLE CUTTING INSERT

Arne R. Jorgensen, Lombard, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 7, 1974, Ser. No. 521,986
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl.² B23B *29/04*
U.S. Cl. 408—146 **4 Claims**

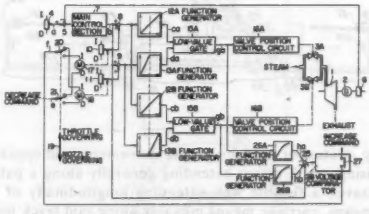


1. A device for holding and automatically indexing a removable cutting insert comprising a plurality of cutting sections which are selectively indexable so as to successively contact the surface of a work piece being machined comprising a tool block for receiving said insert, clamp means for exerting holding pressure on said insert to hold said insert in place in said block, force means for selectively applying and removing force on said clamp means, indexing means for indexing said cutting insert comprising engagement means for engaging said cutting insert in order to rotate said cutting insert through a predetermined angle, operating means for selectively operating said force means in order to apply or release said force on said clamp means and control means coupled to said operating means and to said indexing means and synchronized with said operating means which operates said indexing means so that said indexing means automatically acts to rotate said cutting insert only subsequent to the release of said force on said clamp means by said force means.

3,981,608
TURBINE CONTROL SYSTEM

Seiko Sato, Tokyo; Yutaka Hiyama, Higashiyamato, and Mitsuhisa Yokota, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sept. 4, 1975, Ser. No. 610,238
Int. Cl.² F01B *25/04*
U.S. Cl. 415—15 **6 Claims**



1. A turbine control system for changing two speed governing operations of a steam turbine from a throttle governing operation to a nozzle governing operation and vice versa by controlling a plurality of steam control valves on the basis of a main control flow-rate request signal, which system comprises:

a. a first group of function generators for said throttle governing operation provided respectively for said steam control valves and a second group of function generators for said nozzle governing operation provided respectively for said steam control valves, each function generator producing a function output signal in response to a main control flow-rate request signal applied thereto,

b. a low-value preference circuit provided for each steam control valve for selectively passing the lower of the function output signals applied thereto, said lower function output signal thus passed being utilized to control an opening degree of said steam control valve,

c. first means for obtaining a difference signal between said main control flow-rate request signal and the sum of said function output signals thus passed, and

d. second means for increasing, according to said difference signal, a bias applied to one of said two groups of function generators which operates for one of said two governing operations which is not a speed governing operation intended to effect, and for decreasing a bias applied to the other group of function generators which operates for said speed governing operation intended to effect,

whereby during the speed governing operation changing period of said turbine, the output of said turbine is kept unchanged and no thermal shock is caused to said turbine.

3,981,609
COOLABLE BLADE TIP SHROUD

Robert John Koenig, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed June 2, 1975, Ser. No. 583,143
Int. Cl.² F01D *11/08, 11/10*
U.S. Cl. 415—117 **4 Claims**

1. In a gas turbine engine, a coolable shroud comprising a plurality of arcuate segments disposed in end to end relationship to surround the tips of the rotor blades of the engine wherein each segment has a sealing surface which opposes the tips of the blades and a chamber which extends circumferentially beneath the sealing surface, wherein the improvement comprises:

one or more passages extending from the chamber to the region between adjacent segments to cool the region and to aerodynamically provide continuity between the sealing surfaces of the adjacent segments.

3,981,610
WATER PUMP

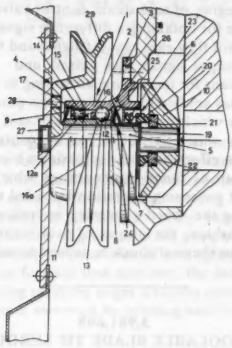
Horst M. Ernst, Eltingshausen; Manfred Brandenstein, Aschfeld, and Armin Olschewski, Schweinfurt, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Amsterdam, Netherlands

Filed Oct. 17, 1974, Ser. No. 515,651

Claims priority, application Germany, Nov. 2, 1973, 7339167

Int. Cl.² F04D *29/44, 7/02*

U.S. Cl. 415—291 C **9 Claims**



1. A water pump for motor vehicles comprising a pump housing, a pump wheel located within said housing and arranged at the end of a shaft, a belt driven pulley for rotating said shaft and a bearing independent of said pump for journalling said shaft, said bearing comprising a fixed race ring having a radially extending flange integrally formed therewith for attachment to the motor of said vehicle, a rotatable race ring and a pair of parallel rows of roll bodies located therebetween, said pulley and said shaft being integrally connected to said rotatable race ring for conjoint rotation therewith, said pulley having a rim for receiving a drive belt extending about said bearing, said rim being arranged so that the line of force applied thereto by the belt lies in a plane extending between the two rows of roll bodies.

3,981,611
ELECTRICAL INTERCONNECTION CIRCUITRY FROM A ROTATING BODY TO A RELATIVELY STATIONARY BODY

Harry Thomas Jensen, Milford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 12, 1975, Ser. No. 549,394

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² B64C *27/32*

U.S. Cl. 416—61 **4 Claims**

1. An electric system including relatively rotating parts with apparatus providing a highly reliable interconnection therebetween, comprising:

first and second bodies each having electrical ground;

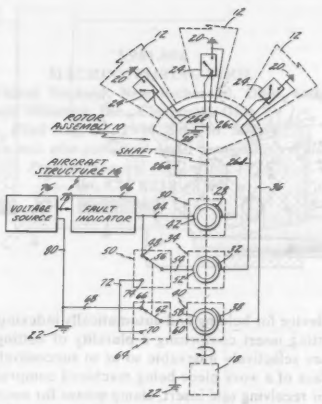
means including a plurality of rotary electrical connection means for disposing one of said bodies for rotation on the other of said bodies with electrical contact therebetween;

a power source having first and second outputs and disposed on a first one of said bodies, said first output connected to ground of said first body;

electric utilization means disposed on said first body having a first terminal connected to said second output, and having a second terminal;

electrical sensing means disposed on the second one of said bodies for sensing a condition on said second body and interconnected from ground on said second body to a group of said plurality of rotary electrical connection means; and

circuitry connected to said second terminal of said utilization means, including switch means having an operating position and a test position and being settable to either of said positions alternatively, said circuitry connecting said utilization means to said sensing means through all of said



rotary electrical connection means in said group in parallel when said switch means is in said operating position and connecting said utilization means to said sensing means through one of said rotary electrical connection means in said group and connecting said sensing means through at least another one of said rotary electrical connection means in said group to ground of said first body when said switch means is in said test position.

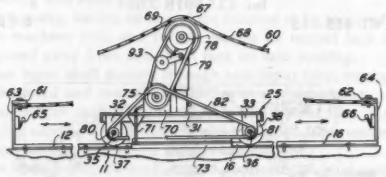
3,981,612
WAVE PRODUCING APPARATUS

Charles Bunger, and Edward R. Fawess, both of 430 Rutgers Road, North Babylon, N.Y. 11704

Filed June 27, 1975, Ser. No. 591,131

Int. Cl.² A47K *3/10*

U.S. Cl. 416—66 **7 Claims**



1. Apparatus for producing wave movement, said apparatus comprising: track means extending generally along a path of wave travel, a flexible web extending longitudinally of said track means, carriage means movable along said track means and engaging an under portion of said web to upwardly flex the engaged web portion, and propulsion for effecting carriage movement along said track means relative to and in upward flexing engagement with said web, whereby said engaged web portion is caused to move and produce a traveling wave.

3,981,613

FOLDABLE PROPELLERS

Nils Oluf Ehrenskjold, Kolding, and Torben Munk, Virum, both of Denmark, assignors to Gori-Vaerk A/S, Kolding, Denmark

Filed July 10, 1974, Ser. No. 487,220

Claims priority, application United Kingdom, July 11, 1973, 33044/73; Oct. 23, 1973, 49219/73

Int. Cl.² B63H 1/24

U.S. Cl. 416—142 6 Claims

1. A propeller adapted to be fully submerged in water for a vehicle such as a boat or the like which is mounted on the aft end of the vehicle drive shaft comprising, in combination, a pair of propeller blades adapted to assume a folded position extending rearwardly of the drive shaft, means for mounting said blades at their inner ends on said shaft for freely pivotal movement into an equilibrium angular position during the forward or rearward powered movement of the vehicle throughout an angular range extending in both directions from a 90° position and in an axial plane with respect to the axis of said shaft whereby when propeller blades are designed for maximum efficiency when the blades are swung for instance 110°–130° away from the folded position for forward motion, the propeller will be approximately equally effective in a position 50°–70° away from the folded position during rearward motion, the shape of the blades being properly adapted to such function.

3,981,614

PUMP WHEEL FOR A HYDRODYNAMIC UNIT

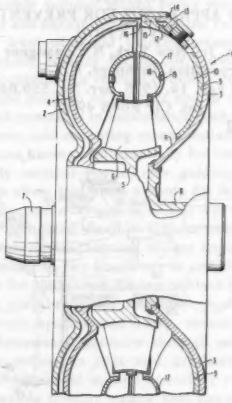
Josef Helmer, Aich, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Sept. 11, 1974, Ser. No. 505,010

Claims priority, application Germany, Sept. 14, 1973, 2346356

Int. Cl.² F01D 5/04

U.S. Cl. 416—180 6 Claims



1. A pump wheel for a hydrodynamic unit with a hub member, a pump wheel outer shell means welded to said hub member, said pump wheel outer shell means essentially consist of cold-deformed sheet metal material, the pump wheel comprising:

a shell member having an outer surface substantially matched to an inner surface of the pump wheel outer shell means,

pump wheel blade means having a variable cross-sectional profile integrally cast with said shell member,

a plurality of torque entrainment means for entraining said shell member and said pump wheel outer shell means, said entrainment means being cast integrally with said shell member and being spaced from each other along the outer circumference of said shell member,

a plurality of spaced apertures provided in the inner surface of the pump wheel outer shell means along the outer circumference thereof for engaging respective ones of said plurality of torque entrainment means,

pins cast integrally at the inner circumference of the pump blade means,

a cast inner ring means having a shell shape substantially similar to the shape of the shell member, and

aperture means provided in said cast inner ring means for receiving said pins, said inner ring means is placed over the pump blade means from the inside thereof, said pins are fused rivet-shaped for the retention of the inner ring means, said pump wheel outer shell means is provided at the output side of the hydrodynamic unit, a second pump wheel outer shell means is provided at the input side of the hydrodynamic unit, a welding seam along the outer circumference of the pump wheel for connecting said pump wheel outer shell means disposed on the output side with said second pump wheel outer shell means disposed at the input side, said pump wheel outer shell means arranged at the output side being provided with a bent portion at the outer circumference thereof within the area of the welding seam, said bent portion producing within the area of the welding seam an air space between the inner surface of the pump wheel outer shell means arranged on the output side and the outer surface of said shell member,

said shell member terminates in an inner edge portion at the outer circumference thereof, said second pump wheel outer shell means including a stepped portion engaging said inner edge portion of said shell member and a further portion extending from said stepped portion, said further portion including an inner surface engaging the outer surface of at least a portion of said bent portion, said further portion of said second pump wheel outer shell means terminating in an outer edge portion, said welding seam being provided at said outer edge portion.

3,981,615

CONTINUOUS CONNECTION DEVICE FOR THE MOBILE BLADES OF A TURBO-MACHINE

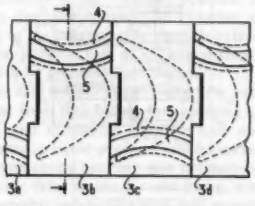
Salomon Krol, Belfort, France, assignor to Groupe Europeen pour la Technique des Turbines a Vapeur G.E.T.T., Paris, France

Filed Nov. 3, 1975, Ser. No. 628,696

Claims priority, application France, Nov. 14, 1974, 74.37586

Int. Cl.² F01D 5/22

U.S. Cl. 416—190 4 Claims



1. In a continuous connection arrangement for the mobile turbine blades of the wheel of a turbo-machine in which each turbine blade is provided with a cap which is integral with it and the turbine blades are installed on the wheel with the caps

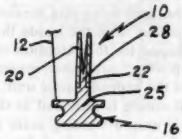
clamped against each other, the improvement wherein at least one turbine blade cap in two comprises at least one recess in which is inserted a flexible clamping blade which may be elastically deformed therein, said clamping blade having at least one free end which overlaps from the blade cap in a tangential direction and presses against the cap of a neighboring turbine blade, causing an elastic deformation of said clamping blade.

3,981,616

HOLLOW COMPOSITE COMPRESSOR BLADE

Hans Stargardter, Bloomfield, and Walter Pilpel, West Hartford, both of Conn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 22, 1974, Ser. No. 516,931
Int. Cl.² F01D 5/14
U.S. Cl. 416—233 **2 Claims**



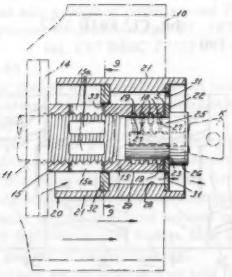
1. A hollow composite compressor blade having an airfoil planform comprising a root section, a pair of upstanding panels made of composite material extending from said root section, said panels forming a cavity therebetween, said panels having an insert located between adjacent panels at the leading edge of said blade and an insert located between adjacent panels at the trailing edge of said blade for securely joining said panels together, a central spar made of composite material and being of unitary construction with and extending in the longitudinal direction from said root section intermediate said panels, said spar terminating in a V-shaped configuration in said longitudinal direction, said V-shaped configuration having a pair of sides and a base, the sides of said V-shaped configuration being in direct contact with said pair of upstanding panels and the base of said V-shaped configuration being located substantially midway between said pair of panels in the transverse direction thereby providing a lightweight, extremely strong blade structure.

3,981,617

MARINE PROPELLER LOCK

Norbert W. Milewicz, 1194 Rolling Hills, Bloomfield Hills, Mich. 48013

Filed Aug. 1, 1974, Ser. No. 493,529
Int. Cl.² B63H 1/20
U.S. Cl. 416—244 B **8 Claims**



1. For use with a marine propeller which is mounted on an output shaft of a power source and which has generally axial openings therein for the passage of engine exhaust gases and engine cooling exhaust waters under high pressure through the propeller hub, the combination comprising

removable fastener means on said shaft for limiting axial movement of the propeller on said shaft,

a cover member having a first end portion thereof adjacent the outer end of the fastener means and a second portion thereof surrounding said fastener means on said output shaft,

a lock insertable through said cover member into said fastener means and having interengaging means thereon engaging said fastener means to hold said cover in position on said shaft and thereby prevent access to said fastener means,

said fastener means, said cover member and said lock being such that, upon rotation, no adverse unbalance is produced,

said second portion of said cover having a free end spaced from the inner end of said fastener means to provide a space through which engine cooling exhaust water and engine gases may flow,

said second portion of said cover being spaced from said fastener means to permit flow of water and exhaust gases substantially axially therethrough,

said first end portion of said cover having openings therein permitting the flow of water and exhaust gases therethrough,

said lock having an axial opening and a radial opening therein extending to said interengaging means whereby water can flow into said lock through said axial opening and out of said lock through said radial opening past said interengaging means,

first passage means from said space between said cover and said fastener means to the interior of said fastener means,

second passage means from the interior of said fastener means to the space between said cover and said fastener means,

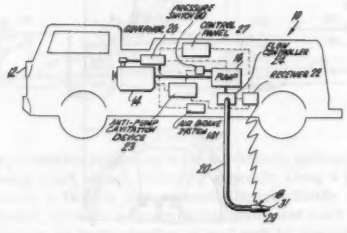
such that exhaust water and exhaust gases flow through said openings in said end portion of said cover to produce a pressure drop to cause flow radially inwardly through said first passage means and induce a flow out of said lock through said second passage means so that exhaust gases entrapped with said water tend to deposit a lubricating film on the interengaging means of said lock and the water removes contaminants and foreign particles from said lock.

3,981,618

METHOD AND APPARATUS FOR PREVENTING PUMP CAVITATION

George R. Nelson, Jr., New York, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Feb. 14, 1975, Ser. No. 550,042
Int. Cl.² F04B 49/08
U.S. Cl. 417—12 **10 Claims**



1. A method of controlling a system having a pump driven by an engine, said pump having a discharge conduit with a variable flow rate controller to prevent cavitation due to

engine overspeed comprising the steps of: continuously sensing the speed of said engine and comparing the speed to a preselected set point speed; generating a command signal when said sensed speed exceeds said set point speed; actuating said flow controller with said command signal to change the flow rate of said discharge conduit by a predetermined decrement; subsequently blocking said command signal from activating said flow controller for a selected time interval to permit the flow rate to reach steady state, while reducing energy input to the engine to cause said engine speed to drop below said set point speed, whereby said engine speed is maintained substantially at said set point speed to prevent cavitation in the pump.

3,981,619

CONTROL DEVICE FOR CONTROLLING THE LEVEL OF A LIQUID IN A CONTAINER

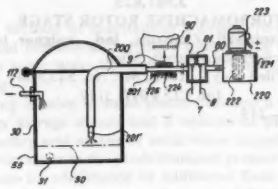
Mathias Mitter, Senne, Germany, assignor to Mitter & Co., Schloss Holte, Germany

Filed Nov. 8, 1973, Ser. No. 413,992

Claims priority, application Germany, Nov. 9, 1972, 410550[U]

Int. Cl.[2] F04B 49/00

U.S. Cl. 417—38 **6 Claims**



1. Control device for controlling the level of liquid in a container and the like, comprising a container adapted to be filled with liquid up to a predetermined level; elongated flexible tubular means for transmitting a gas therethrough, said elongated flexible tubular means being movable relative to said container and having a free end in the container upwardly adjacent the level of liquid therein; means mounting said elongated flexible tubular means for movement in a path having a horizontal and a vertical component to thereby steplessly adjust the position of the free end in vertical direction relative to said container in accordance with the desired level of liquid therein, said mounting means including rigid stationary guide means having a substantially horizontal portion and a substantially vertical portion for guiding said elongated flexible means along said path; a pump for feeding liquid into said container; and a switch actuated by said gas passing through said elongated flexible tubular means, said switch comprising a membrane, spring means engaging said membrane and tending to flex the latter in one direction, control circuit means for said pump having contact means cooperating with said membrane for normally closing said contact means to thereby operate said pump, means for passing said gas at a predetermined pressure through said flexible elongated tubular means so that said predetermined pressure changes when the liquid in said container reaches said free end of said flexible tubular means, said gas cooperating with said membrane to flex the latter, upon change of said predetermined pressure, in a direction opposite to the one direction to thereby open said contact means and stop operation of said pump.

3,981,620

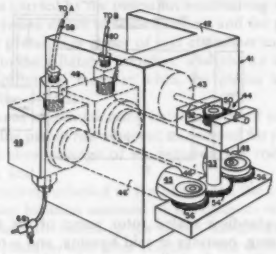
PUMPING APPARATUS

Louis Abrahams, Worcester; Burleigh M. Hutchins, Jr., and James L. Waters, both of Framingham, all of Mass., assignors to Waters Associates, Inc., Framingham, Mass.

Division of Ser. No. 232,128, March 6, 1972, Pat. No. 3,855,129. This application Nov. 19, 1973, Ser. No. 417,146

Int. Cl.[2] F04B 49/00

U.S. Cl. 417—42 **15 Claims**



1. A positive-displacement pump comprising a plurality of pump chambers,

plungers positioned for reciprocal motion in each said chamber, and operating means for moving said plungers independently from one another;

said operating means including means to synchronize the movement of plungers in said chambers to maintain the sum of fluid flowing from all said chambers at a substantially constant displacement rate,

said pump adapted to hold less than about 3 milliliters liquid volume,

means for pushing each said plunger assembly foward to an extended position within its chamber wherein it largely fills said chamber,

means for pulling each said plunger backwards to a retracted position wherein it is largely removed from its chamber,

seal means between each said chamber and said push and pull means; and wherein

a fluid inlet is positioned at an inlet end of each said chamber,

a fluid outlet is positioned at an outlet end of each said chamber,

wherein each said plunger, in extended position, forms a thin annular conduit with the chamber wall, said conduit forming means for fluid first entering said chamber at one said port during said plunger's movement from the extended position to the retracted position, to be also the fluid first discharged from said chamber at the second said port as the plunger returns to its extended position;

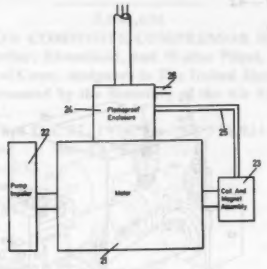
wherein said pump is free of additional structure between said fluid inlet and said fluid outlet;

and wherein said system comprises a flow path comprising said outlet from said system for supplying a liquid under pressure, and interposed between said pump and said system outlet, a liquid-pressure sensing means and, operably communicating between said pressure-sensing means and a motor drive means for said pump, a motor control means operably interacting with said motor drive means to continuously control the flow-output of said pump by continuously controlling the speed of said motor in response to said pressure.

3,981,621
BEARING WEAR DETECTION DEVICES

William Howard Considine, Storrington, England, assignor to The A.P.V. Company Limited, Crawley, England

Filed Mar. 27, 1975, Ser. No. 562,868
Int. Cl.² F04B 49/06
U.S. Cl. 417—44 14 Claims

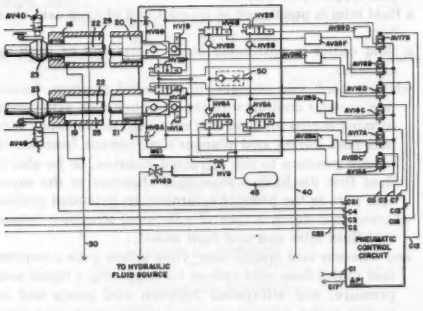


1. In a gland less sealed rotor pump of the type having a static housing, bearings in said housing, and a rotor mounted in said bearings and wholly contained within said housing: the improvement comprising an electromagnetic bearing wear detection system including magnet means mounted on said rotor and a coil mounted coaxially on said rotor outside said housing immediately adjacent the path of said magnet means as said rotor rotates, said magnet means being mounted eccentrically of said rotor so as to follow a circular path at a constant distance from said coil as said rotor rotates truly in said bearings whereby the flux threading said coil remains constant, but to follow a circular path varying in distance from said coil if said rotor rotates eccentrically whereby the flux threading said coil varies and induces an alternating e.m.f. in said coil, the amplitude of the e.m.f. varying with the eccentricity of said rotor and the frequency of the e.m.f. varying with the speed of rotation of said rotor.

3,981,622
HYDRAULIC INTENSIFIER CONTROL SYSTEM

Richard W. Hall, and Sven Sonnenberg, both of Springfield, Ohio, assignors to Kelsey-Hayes Company, Springfield, Ohio

Filed Nov. 20, 1974, Ser. No. 525,567
Int. Cl.² F04B 49/00, 17/00, 35/00
U.S. Cl. 417—46 7 Claims



1. In a hydraulic intensifier for oil well fracturing, erosion drilling or the like, in which a pair of working rams are sequentially operated by a corresponding pair of hydraulic cylinder motors from a source of hydraulic fluid under high pressure and in which said motors move between retracted and extended positions, the improvement comprising:

first valve means for applying hydraulic fluid from said source selectively to said cylinder motors for causing extending movement thereof and a corresponding working stroke of the ram associated therewith,

accumulator means connected to said source through means defining a restricted orifice to bleed off a portion of the output of said source,

second valve means responsive to the return of each of said cylinder motors to their corresponding retracted positions for connecting said motors to said accumulator means for precompressing said motors prior to the initiation of the direct application of hydraulic fluid from said source,

means responsive to the arrival of each of said cylinder motors toward their respective extended positions for applying hydraulic fluid from said source to the other motor which has been precompressed in its retracted position, so that the output pressure of the intensifier remains essentially uninterrupted,

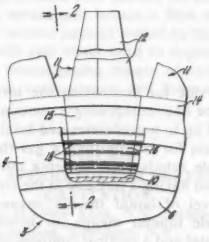
means for depressurizing each said cylinder motor at its extended position upon the direct application of said source to the other motor, and

means for returning each said depressurized cylinder motor from its extended position to its retracted position at a rate which exceeds the rate at which said motors move from their respective retracted positions to their extended positions.

3,981,623
TURBOMACHINE ROTOR STAGE

Robert H. Aspinwall, Zionsville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 2, 1975, Ser. No. 573,966
Int. Cl.² F01D 5/30
U.S. Cl. 416—215 2 Claims



1. A turbomachine rotor stage comprising a wheel including a disk and a rim at the periphery of the disk, the rim being substantially bilaterally symmetrical with respect to the central plane of the disk and having an axially central undercut circumferential slot for retention of blade roots; and an annular row of blade elements having roots mounted in the said slot; wherein the improvement comprises a rim the cross-section of which at each side of the said slot in any plane containing the axis of rotation of the wheel is substantially symmetrical about a line through the centroid of the section and parallel to the said axis of rotation and is asymmetrical about a line through the centroid of the section and normal to the said axis of rotation, and is of such a cross-section that the flexural center of each side of the rim is axially inboard of the radial plane of action of centrifugal forces exerted by the blade roots on the said side due to rotation of the rotor stage about the said axis.

3,981,624

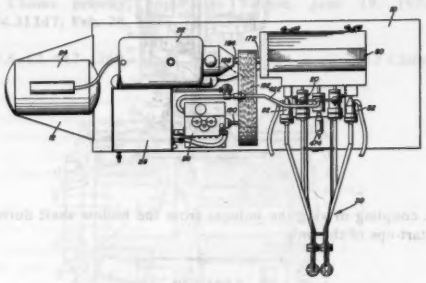
SONIC OR ENERGY WAVE GENERATOR AND MODULATOR

Clarence W. Brandon, Nashville, Tenn., assignor to Orpha B. Brandon, Nashville, Tenn., a part interest

Continuation-in-part of Ser. No. 611,082, Jan. 23, 1967, Pat. No. 3,765,804, which is a continuation-in-part of Ser. No. 665,995, June 17, 1957, Pat. No. 3,302,720, which is a continuation-in-part of Ser. Nos. 296,038, June 27, 1952, Pat. No. 2,866,509, and Ser. No. 241,647, Aug. 13, 1951, Pat. No. 2,796,109. This application Oct. 12, 1973, Ser. No. 406,045

Int. Cl.[2] F04B *49/00, 47/00*

U.S. Cl. 417—53 41 Claims



1. That method of maintaining a predetermined pressure upon a fluid medium and thereby transmitting a sonic wave between a sonic wave generator and a means of reception comprising

oscillating a valve in head piston between a compressible energy storage means and a column of pressured fluid contacting said means of sonic wave reception,

making up losses in the predetermined pressure of said fluid medium by admittance of additional fluid through said piston valve from a source of pressured fluid during accelerated rarefaction oscillations of said piston against said compressible energy storage means,

adding said additional fluid into said fluid medium during compressional oscillations of said piston,

including increasing the pressure being maintained on said fluid medium column by increasing the accelerations imposed on said rarefaction oscillations.

3,981,625

PUMP WITH GAUGE MEANS

Chester H. Wickenberg, Elgin, Ill., assignor to Dahltron Corporation, Lombard, Ill.

Continuation of Ser. No. 444,873, Feb. 22, 1974, abandoned. This application Apr. 24, 1975, Ser. No. 571,316

Int. Cl.[2] F04B *21/00, 21/04;* B60C *23/02*

U.S. Cl. 417—63 20 Claims

1. A pump for inflating an inflatable member, comprising:

an elongated hollow cylinder having a first closure adjacent one end of the cylinder and a second closure adjacent the other end of the cylinder, said second closure having a bore extending therethrough;

a piston slidably received for reciprocation in said cylinder, said piston separating the inside of the cylinder into a first chamber intermediate the piston and the first closure and a second chamber intermediate the piston and the second closure;

a hollow piston rod having one end connected to the piston and the other end extending out of the cylinder, said rod being slidably received in the bore of the second closure;

means for connecting the other end of the rod to the inflatable member;

first one-way valve means adjacent the first closure for permitting passage of air from outside the cylinder into the first chamber and preventing passage of air out of the first chamber;

second one-way valve means adjacent the second closure for permitting passage of air from outside the cylinder into the second chamber and preventing passage of air out of the second chamber;

valve means carried by the piston for establishing communication between either of said chambers and the piston rod when the pressure in either of said chambers exceeds the pressure in the inflatable member, whereby air is pumped into the inflatable member when the piston is reciprocated in the cylinder;

opening means communicating between one of said chambers and the piston rod adjacent its one end for permitting relatively slow passage of air between the rod and one chamber; and

means operatively coupled to the piston and the cylinder to indicate the location assumed by the cylinder relative the piston after movement of the piston toward the end of said one chamber and after release of the cylinder measuring the amount of pressure in the inflatable member.

3,981,626

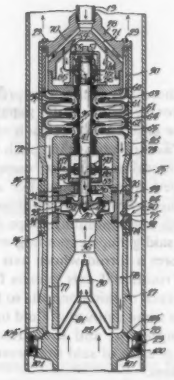
DOWN HOLE PUMP AND METHOD OF DEEP WELL PUMPING

Hasan F. Onal, Denver, Colo., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 6, 1975, Ser. No. 547,392

Int. Cl.[2] F04D *13/04, 13/12*

U.S. Cl. 417—89 3 Claims



1. A method of deep well pumping of liquid comprising, placing a turbine driven pump at the desired depth in a well casing and sealing the pump to the well casing in a seal area with a pump inlet communicating with the liquid in the well and a pump outlet communicating with the well casing above the seal area for delivery of pumped liquid to the surface using the well casing as a conduit, returning a predetermined proportion of the pumped liquid from the surface under pressure to provide power liquid for driving said turbine, filtering of said predetermined proportion of pumped liquid prior to return thereof, directing some of said returned filtered liquid in advance of said turbine to bearings for the turbine driven pump to provide lubrication thereof, and delivering said power liquid exhausted from the turbine to the pump inlet

area in a manner to provide a net positive suction head and prevent cavitation.

3,981,627

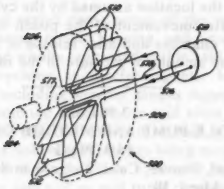
ROTARY THERMODYNAMIC COMPRESSOR

Frederick W. Kantor, 523 W. 112th St., New York, N.Y. 10025

Division of Ser. No. 864,112, Oct. 6, 1969, Pat. No. 3,808,828, which is a continuation-in-part of Ser. No. 608,323, Jan. 10, 1967, Pat. No. 3,470,704. This application Apr. 16, 1974, Ser. No. 461,452

Int. Cl.[2] F04B *39/00*

U.S. Cl. 417—207 3 Claims



1. A rotary thermodynamic compressor comprising, in combination, a rotary drive shaft, a pair of conduits, each conduit forming a group of loops each of which is transverse to the rotational axis of said shaft, each of said loops having first and second sections extending outwardly from said axis at locations spaced from one another along said axis, said groups of loops being arranged about said rotational axis in opposed pairs with corresponding loops directly opposite one another, each of said groups extending around said rotational axis to tend to form a toroid whose axis extends in the same direction as said rotational axis, means for delivering a compressible fluid to each of said conduits so that said corresponding loops have the same amount of fluid in them to rotationally balance said compressor, and heat transfer means for conducting heat out of each of said first sections and into each of said second sections.

3,981,628

PUMP

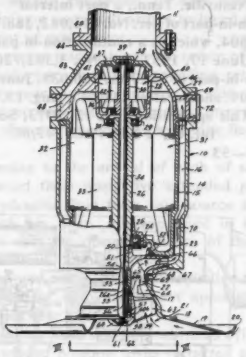
James C. Carter, 1735 San Pasqual St., Pasadena, Calif. 91106

Filed Apr. 8, 1974, Ser. No. 459,022

Int. Cl.[2] F04D *13/12*

U.S. Cl. 417—247 9 Claims

1. In a submersible electric motor driven centrifugal pump unit with an inducer in the pump inlet ahead of the pump impeller supported on a hollow motor driven impeller shaft, the improvements of a second shaft extending through said hollow shaft coupled to said inducer, a turbine in the top end of said unit driven by pumpage from the impeller and driving said second shaft at a lower speed than said hollow shaft, and



a coupling driving the inducer from the hollow shaft during start-ups of the unit.

3,981,629

SWASH-PLATE TYPE COMPRESSOR FOR AIR CONDITIONING OF VEHICLES

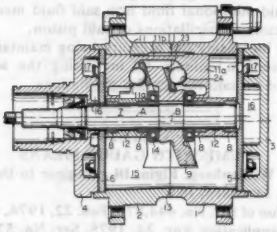
Shozo Nakayama; Takeshi Toriyama, both of Kariya, and Takeshi Higuchi, Ohbu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

Filed Sept. 15, 1972, Ser. No. 289,727

Claims priority, application Japan, Sept. 21, 1971, 46-86057[U]

Int. Cl.[2] F04B *1/12*

U.S. Cl. 417—269 3 Claims



1. In a shell elimination type swash plate compressor for air conditioning vehicles, of the type having a pair of cylindrical cylinder blocks combined with each other in axial alignment and forming the outer surface of the compressor body, a pair of cylinder heads coaxially connected to the outer ends of said combined cylindrical cylinder blocks by way of valve plates, each cylinder head having a suction chamber and a discharge chamber, said combined cylindrical cylinder blocks having three axially aligned bores extending therein, a piston slidably held in each bore, a drive shaft connected to a driving source, and a swash plate mechanism for moving said pistons and rigidly mounted on said drive shaft; the improvement wherein said drive shaft is mounted with its center line axially extending and located radially spaced from the geometrical longitudinal center line of said combined cylindrical cylinder blocks, and said three bores are disposed with equiangular spacing on a circle about said center line of said drive shaft whereby one of the three sector spaces defined by adjacent pairs of said

three bores and an inside wall of said cylindrical cylinder blocks has a volume larger than those of the remaining two sector spaces, said larger volume sector space having a lubrication reservoir formed therein, said swash plate mechanism extending into said reservoir, whereby the periphery of said swash plate mechanism is farther from the outer wall of said cylinder blocks in the region of said reservoir than in a region of the cylinder blocks diametrically opposite said reservoir.

3,981,630

HYDRAULIC SWASH PLATE PUMPS

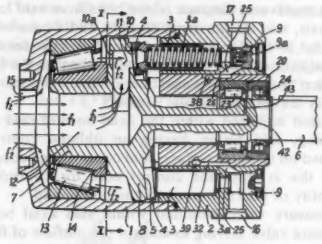
Gérard Leduc, 88, rue d'Alsace, 88 Saint-Die, and Michel Leduc, 54 Azerailles, both of France

Filed May 27, 1975, Ser. No. 580,973

Claims priority, application France, June 19, 1974, 74.21247; Feb. 28, 1975, 75.06331

Int. Cl.² F04B 1/12

U.S. Cl. 417—269 12 Claims



1. A swash plate pump of the type comprising a plurality of pistons bearing against a plate driven by a driving shaft, said plate being inclined relatively to said driving shaft in such a manner that the pistons are given a reciprocating movement when said plate is driven by said shaft, in which the drive shaft has a first portion and a hollow portion, which hollow portion forms an axial conduit for admission of a hydraulic liquid; said plate being mounted on said shaft at the junction between said first portion and said hollow portion, said plate having a recess communicating with said axial liquid supply duct and a port for distribution of the liquid to said pistons, said port being formed on the rear face of said plate, said plurality of pistons being arranged in a circle concentrically with said first portion of said shaft and bearing against said rear face of said plate, and a taper roller bearing mounted on said hollow portion of said shaft and against which the front face of said plate bears.

3,981,631

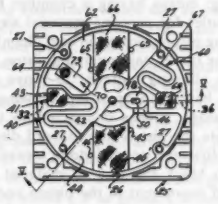
COMPRESSOR HEAD CONSTRUCTION

Donald P. Kemp, Stevensville, Mich., assignor to Gast Manufacturing Corporation, Benton Harbor, Mich.

Filed Jan. 16, 1974, Ser. No. 433,820

Int. Cl.² F04B 21/00, 39/00

U.S. Cl. 417—312 3 Claims



1. A compressor head construction comprising:

a head adapted to be attached to a compressor cylinder and including a surface defining a wall of the compression chamber of said cylinder;

inlet and outlet ports formed in said head;

first channel means formed in said head on a side opposite said surface defining a wall of the compression chamber and first aperture means extending through said head for coupling said inlet port to said compression chamber adjacent an opposite side of said casting, said first channel means including an elongated, generally S-shaped portion coupled at one end to said inlet port, an enlarged filter receiving portion having a depth greater than said elongated portion and coupled at one end for said elongated portion and further including filter means disposed in said enlarged portion for filtering air entering said compression chamber;

second channel means formed in said head on a side opposite said surface defining a wall of the compression chamber and second aperture means extending through said head for coupling said compression chamber to said outlet port;

cover means removably secured only to said head to permit access to said filter means and for sealably covering said first and second channel means; and

valve means coupled to said head to permit air to be compressed to enter said compressor only through said inlet port and exit said compressor only through said outlet port.

3,981,632

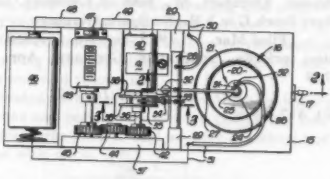
METERING PUMP

Halbert Allen LeFebre, 66 Monte Veda, P. O. Box 314, Orinda, Calif. 94563

Filed Apr. 24, 1975, Ser. No. 571,317

Int. Cl.² F04B 19/00

U.S. Cl. 417—413 13 Claims



1. In a metering pump for measuring the flow of a fluid, the combination of a variable-volume chamber which expands and contracts as fluid admitted thereto and withdrawn therefrom, respectively, means for reciprocatively altering the volume of the chamber including resilient means urging the chamber toward one direction of volume alteration at a rate determined by the externally-determined rate of the fluid flow and mechanical means for positively altering the chamber volume in the other direction, the mechanical means being ineffective to control the chamber volume during at least a part of the volume alteration in the said one direction, valve means for the chamber arranged to cause fluid flow therethrough upon reciprocative alteration of the chamber volume, and means for counting the alterations of the chamber volume, said counting means being effective only during alteration of the chamber volume in one of said directions.

3,981,633

PUMP

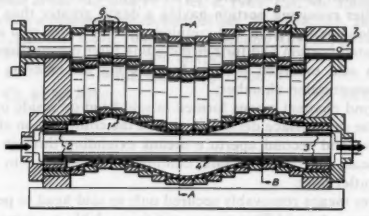
Karl Bertil Wall, Malmo, Sweden, assignor to AB Ljungmans Verkstader, Malmo, Sweden

Filed June 17, 1975, Ser. No. 587,788

Claims priority, application Sweden, June 25, 1974, 7408327

Int. Cl.[2] F04B *43/08, 43/12, 45/06*

U.S. Cl. 417—474 10 Claims



1. A pump comprising, an elastic hose having open inlet and outlet ends, an elongated bar member mounted within said hose and extending substantially the full length thereof, hose actuator means operable to impart to the portion of said hose between said ends a progressive transverse undulating movement about said bar, said actuator means including movable means engaging and deflecting said hose for providing at all times a movable seal between said hose and said bar on opposite sides with said hose maintaining a substantially uniform cross section along its length during said movement, said hose cooperating with said bar to at least substantially seal from one another the spaces within said hose on said opposite sides of said bar.

3,981,634

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

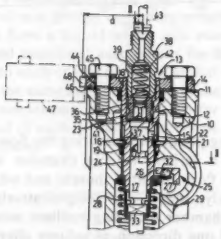
Heinrich Staudt, Markgroningen-Talhausen, and Eberhard Hofmann, Kirchbert, M., both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Mar. 27, 1975, Ser. No. 562,858

Claims priority, application Germany, Apr. 1, 1974, 2415719

Int. Cl.[2] F04B *39/10, 7/04*

U.S. Cl. 417—499 4 Claims



1. In combination, a fuel injection pump for use in internal combustion engines, and an adjustment tool for adjusting the basic fuel quantity setting for the pump, the pump including:

a. a housing within which there is formed at least one bore for receiving a piston and an associated guiding structure, and an associated pair of bolt receiving bores, with all the bores extending into the body of the housing from an upper end face thereof;

b. a cylinder bushing mounted within the receiving bore of the housing and forming the guiding structure for the piston, the cylinder bushing forming an axial bore into which the piston extends and within which the piston is displaced, and at least one control bore in the side wall thereof; said cylinder bushing being received within the receiving bore of the housing so that it can be rotated within a limited angular region for effecting a basic setting of fuel quantity supplied by the pump;

c. a pair of bolts;

d. a mounting flange fastened to the cylinder housing and extending transversely outwardly therefrom, said mounting flange including a pair of bores which align with the bolt receiving bores when the mounting flange is mounted to the upper end face of the housing by the pair of bolts, said mounting flange including an adjustment tool engaging portion at the outer circumference thereof, said engaging portion being formed as a slot within the mounting flange located at a greater transverse distance from the longitudinal axis of the cylinder bushing than the maximum transverse distance of the bolts from said longitudinal axis, said slot having side walls and a base which are parallel to the longitudinal axis of the cylinder bushing, the adjustment tool being adapted to engage the engaging portion to effect the rotation of the cylinder bushing within the limited angular region;

e. a piston mounted within the axial bore of said cylinder bushing, said piston having an oblique control edge formed on its outer surface, said control edge cooperating with the at least one control bore for controlling the quantity of fuel delivered by the pump; and

f. a pressure valve mounted within said axial bore, said pressure valve serving to control the outflow of fuel from the pump under the injection pressure.

3,981,635

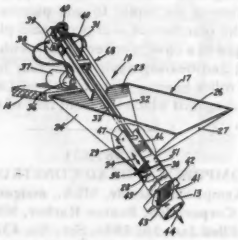
MATERIAL HANDLING SYSTEM

Junior M. Hedlund, Boyceville, Wis., assignor to Hedlund Manufacturing Co., Inc., Boyceville, Wis.

Division of Ser. No. 397,380, Sept. 14, 1973, Pat. No. 3,872,981. This application Feb. 28, 1975, Ser. No. 553,913

Int. Cl.[2] F04B *21/04*

U.S. Cl. 417—551 26 Claims



1. A pumping apparatus for moving material to a selected location comprising: means having a chamber for receiving material and an outlet for carrying material away from the chamber, a pumping piston located in said chamber for moving material into the outlet, said pumping piston having walls forming a passage allowing material to move through the piston, said piston having an open top allowing material to move into the passage, means connected to the pumping piston to reciprocate the piston in a forward direction and a reverse direction, first and second door means movable to closed positions to block the flow of material through the passage on forward movement of the piston and movable to open positions to permit the flow of material through the passage on reverse movement of the piston, separate pivot means pivotally mounting said first and second door means on

said piston for movement about separate axes providing for movement of the door means between the closed positions and open positions thereof, and means having stop means secured to the piston engageable with at least one of the door means when the door means are in the closed positions to prevent movement of the door means in a reverse direction beyond the closed positions thereof whereby the door means remain in the closed positions on forward movement of the piston so that the door means moves material in front of the door means through the outlet on movement of the piston in the forward direction and said door means move away from the stop means to open positions on movement of the piston in the reverse direction whereby material can move through the passage of the piston to the outlet.

3,981,636

DIAPHRAGM VACUUM PUMP

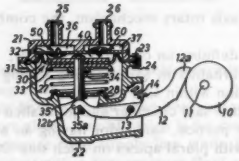
Shigeru Aoki, Toyota; Katuya Suzuki, Seto, and Tosimitu Sakai, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 489,362, July 17, 1974, abandoned. This application Nov. 3, 1975, Ser. No. 628,403

Claims priority, application Japan, July 20, 1973, 48-81619

Int. Cl.[2] F04B *21/02;* **F16K** *15/14*

U.S. Cl. 417—566 **8 Claims**



1. A diaphragm vacuum pump having a plurality of check valves for allowing flow into and out from a suction chamber having a diaphragm-piston assembly for creating suction therein wherein each check valve comprises:

a valve body made of plastic material in a mushroom configuration having a circular cap and a neck portion including an annular groove,

a plate member including a flat valve seat surface to be engaged with the annular rim of the cap portion of said valve body,

a circular assembling hole to be coupled with the neck portion of said valve body, and

a plurality of circular openings disposed symmetrically on a circular path concentric with said assembling hole so as to be normally closed by the annular rim of the cap portion of said valve body, the neck portion of said valve body being assembled within said assembling hole so that said groove is registered with said assembling hole through said plate, said neck portion being under an axially and radially compressed condition to air-tightly engage the annular rim of the cap portion of said valve body against said valve seat surface of said plate member, the ratio of the radius of said circular path to the radius of the cap portion of the valve body being in the range from about 0.5 to about 0.65, the ratio of the width of said plate to the width of said annular groove being in the range from about 1.2 to about 1.4, and the ratio of the diameter of the assembling hole to the normal diameter of the neck portion of the valve body being about equal to or less than 1.1.

3,981,637

VARIABLE DISPLACEMENT ROTARY MACHINE WITH OSCILLATING PISTON SLIDES

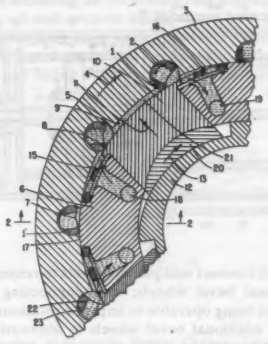
Arno Fischer, Pfistermuhle, 8121 Rottenbuch, Upper Bavaria, Germany

Continuation-in-part of Ser. No. 315,337, Dec. 15, 1972, abandoned. This application Nov. 11, 1974, Ser. No. 522,447

Claims priority, application Germany, Dec. 21, 1971, 2163423

Int. Cl.[2] F01C *1/00, 21/16;* **F03C** *3/00;* **F04C** *1/00*

U.S. Cl. 418—22 **18 Claims**



1. A rotary piston engine comprising:

A. a symmetrical rotor including bearing means;

B. a plurality of oscillating piston slides supported in said bearing means, each of said slides having a semilunar cross section and comprising a notch including a working surface on one side thereof and a rearward recess in communication with said working surface via a duct;

C. a symmetrical stator, arranged concentrically with said rotor, having inner, outer and lateral surfaces, including,

a. successive separating parts spaced around said stator and cooperating with said rotor and said slides, a portion of each separating part abutting said rotor,

b. feed ports and discharge ports between each of said portions communicating with a conveying medium,

c. a working chamber defined between each of said portions and said rotor, and

d. perforated coverings over said feed and discharge ports between said ports and said rotor, connecting said feed and discharge ports to said working chambers and said piston slide ducts.

3,981,638

ROTARY PISTON MACHINE

Johann Hutterer, Vienna, Austria, assignor to David Godfrey Williams, Merseyside, England, a part interest

Filed Mar. 24, 1975, Ser. No. 561,217

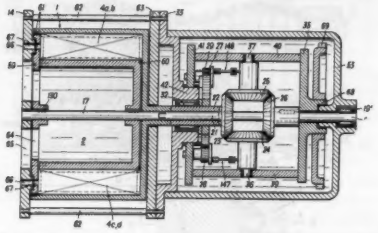
Claims priority, application Austria, Mar. 25, 1974, 2439/74

Int. Cl.[2] F01C *1/42;* **F02B** *55/14*

U.S. Cl. 418—34 **8 Claims**

1. A rotary piston machine comprising an outer rotary piston and an inner rotary piston which define between them an annular working space, which is divided into a plurality of sealed chambers by bars, which extent in alternation from said outer and inner rotary pistons, and a differential gear assembly which operatively connects said outer and inner rotary pistons, which perform a differential rotational movement whereby the volumes of said sealed chambers are periodically changed, said differential gear assembly comprising a bevel gear assembly and an epicyclic gear assembly, said bevel gear assembly having two mutually confronting, coaxial bevel wheels which are coaxial with said annular working space, and

two intervening additional bevel wheels, which are in mesh with the two first-mentioned bevel wheels and rotatable on an axis that is at right angles to the axis of rotation of said coaxial bevel wheels, one of said two coaxial bevel wheels being operatively connected to said outer rotary piston, the other of said two coaxial bevel wheels being operatively connected to said inner rotary piston, said epicyclic gear assembly having a sun wheel and two planet wheels in mesh with said sun wheel, said differential gear assembly also comprising connecting



means, which connect said planet wheels to respective ones of said additional bevel wheels, said connecting means and planet wheels being operable to impart a rotational movement to said two additional bevel wheels in alternating senses of rotation to produce the differential rotational movement of said rotary pistons, said rotary pistons being pot-shaped and nested one within the other, the shells of said pots defining between them said working space, and the bars which divide said working space being fixed in alternation to the shell of one and the other of said pots.

3,981,639

NUTATING ENGINE

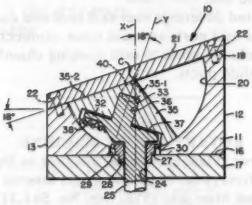
Robert H. Wahl, 1747 Creek Road, Rochester, N.Y. 14625

Filed Sept. 24, 1974, Ser. No. 508,744

The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.

Int. Cl.² F04C *1/00*

U.S. Cl. 418—49 **7 Claims**



1. An engine, comprising

a housing having therein a hemispherical chamber bound in part by a first, plane surface disposed diametrally of the sphere of which said chamber is a segment,

a rotor in said chamber having the configuration of a spherical wedge, and having a pair of intersecting, surfaces forming an apex extending diametrally across said chamber and in sliding engagement with said first surface,

a shaft projecting at one end part way into said chamber and rotatable about a first axis inclined to said first surface and extending through a point common to the centers of said first surface and said sphere, and

means mounting said rotor on said one end of said shaft for rotation relative thereto about a second axis inclined to said first axis and extending through said point coaxially of said rotor,

said mounting means including phasing means for effecting one half revolution of said rotor about said point for each revolution of said shaft, thereby to pivot said rotor in opposite directions about its apex during each revolution of said rotor, whereby said intersecting surfaces on said rotor are alternately swung toward and away from said first surface to effect compression and expansion, respectively, of the corresponding portions of said chamber.

3,981,640

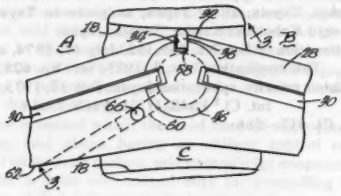
SLANT AXIS ROTARY MECHANISM

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 8, 1975, Ser. No. 611,033

Int. Cl.² F04C *27/00*; F01C *19/10*

U.S. Cl. 418—51 **7 Claims**



1. In a slant axis rotary mechanism, the combination comprising

a. a housing defining an operating chamber,

b. a shaft journalled in said housing having an angularly offset portion within said chamber,

c. a rotor within said chamber and journalled on said angularly offset portion, said rotor having an annular flange provided with plural apices on each side thereof,

d. peripheral seal means about the periphery of said flange sealingly engaging said housing,

e. a generally radially extending groove at each apex,

f. an apex seal loosely carried in each groove and sealingly engaging said housing, and

g. a bolt seal at each apex on the periphery of said flange and sealingly engaging said housing, each said bolt seal having a first pressure-responsive surface in fluid communication with the corresponding groove and a second pressure-responsive surface in fluid communication with the side of the flange opposite the corresponding apex.

3,981,641

HYDRAULIC MOTOR WITH ORBITING DRIVE MEMBER

Michael A. D'Amato, 1200 E. Main St., Waukesha, Wis. 53186

Filed Oct. 8, 1975, Ser. No. 620,697

Int. Cl.² F01C *1/02*, *21/00*, *19/08*, *21/04*

U.S. Cl. 418—61 R **7 Claims**

1. An orbital drive fluid motor comprising

a casing defining a cavity bonded by an inwardly facing annular surface,

a rotatable drive shaft extending through said cavity and having a pinion thereon,

an annular drive member having

an inner periphery larger than and surrounding said pinion with teeth thereon which are more in number than the teeth on said pinion,

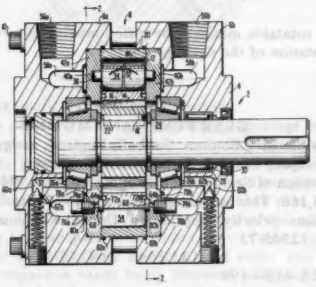
an outer periphery surrounded by and smaller in diameter than the annular surface bonding said chamber, and opposite end surfaces,

a pair of port plates having inner surfaces respectively disposed against the end surfaces of said drive member and having limited freedom of movement towards and away from the same,

a plurality of divider means extending between the outer periphery of the drive member and the surrounding annular surface and providing therebetween a plurality of fluid coupling chambers,

a plurality of eccentric bearing members extending through bores through said drive member from end-to-end thereof and having opposite ends thereof supported in said port plates,

said bearing members restraining said drive members against other than orbital movement wherein the teeth on the inner periphery thereof engage the teeth a few at a time of the pinion and wherein fluid coupling chambers on one side of the drive member undergo expansive phases while those on the opposite side undergo contractile phrases, said drive member having on



opposite ends thereof slots which terminate at said fluid coupling chambers,

said casing having trepan chambers on each outer side of said port plates, one of which is for connection with a high pressure fluid supply line while the other is for connection with a low pressure fluid return line, said port plates having therethrough ports, those on one of which plates register with slots terminating in fluid coupling chambers on one end of said drive members and connect the same with one of said trepan chambers while those on the other plate connect said fluid coupling chambers on the other side of said drive member with the other trepan chamber,

means for hydraulically balancing the opposite sides of said port plates, and means for charging the bearing bores with fluid from said fluid coupling chambers.

3,981,642

PROTECTIVE DEVICE FOR ROTARY ENGINE OIL SEAL

Kazuhiro Kawamura, and Kunihiko Mizutani, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

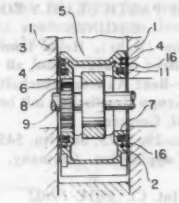
Filed June 10, 1974, Ser. No. 478,091

Claims priority, application Japan, July 9, 1973, 48-80535[U]

Int. Cl.[2] F01C *19/08, 21/04*

U.S. Cl. 418—91 **1 Claim**

1. A rotary engine comprising, in combination: an eccentrically rotatable rotor; a rotor housing including housing sides located on both sides of said rotor closely adjacent thereto; a lubricating section located generally centrally of said rotor and adapted to have lubricating oil contained therein; a combustion chamber defined within said housing radially outwardly of said lubricating section peripherally of said rotor; annular oil seals each including an O-ring provided on both sides of said rotor between said rotor and said housing sides to prevent lubricating oil in said lubricating section from escaping radially outwardly of said rotor into said combustion section; and a protective device for said oil seals located radially outwardly of said oil seals and extending completely thereabout on both sides of said rotor, said protective device comprising: annular grooves defined in said rotor on both sides thereof; said grooves being located radially outwardly of each of said oil seals and extending completely thereabout concentrically with said oil seals in close proximity thereto; sealing rings extending continuously within said grooves; spring means fitted respectively within each of said grooves urging said sealing rings against said housing sides in sliding engagement therewith to prevent exposure of said oil seals to combustion gases escaping from said combustion chamber, said oil seals including an oil sealing ring extending continuously within oil seal grooves provided on both sides of said rotor, said oil sealing rings each defining a circumferentially extending U-shaped cavity therein opening radially inwardly of said rotor and facing away from said annular grooves of said



protective device, said cavity having O-rings located therein; and gas sealing means provided on both sides of said rotor between said rotor and said housing sides to prevent combustion gases from said combustion chamber from escaping radially inwardly of said rotor and from coming into contact with said annular oil means, said gas sealing means being located radially outwardly of said protective device and extending to surround said protective device and said annular oil seals in an arrangement having said protective device radially juxtaposed between said gas sealing means and said annular oil seals; said housing sides comprising a generally flat planar configuration with each of said sealing rings of said protective device comprising a flat planar abutment face extending generally parallel to said housing sides and urged by said spring means into abutting relationship therewith across substantially the entire area of said face of said sealing rings.

3,981,643

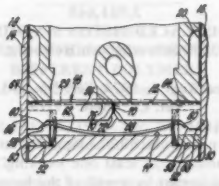
ROTARY COMBUSTION ENGINE TWO-PIECE APEX SEAL ARRANGEMENT

Raymond P. Canale, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 29, 1974, Ser. No. 528,433

Int. Cl.[2] F01C *19/04, 19/08;* **F04C** *27/00*

U.S. Cl. 418—119 **1 Claim**



1. An apex sal arrangement for a rotary combustion engine having an inner peripheral wall and oppositely facing side walls and a rotor between the side walls with apexes that remain adjacent the peripheral wall as the rotor rotates and a peripheral port in the peripheral wall with a bridge across the center, said apex seal arrangement comprising a pair of apex seal segments arranged in a slot in each rotor apex with oppo-

sitely facing inner ends and outer ends that face the respective side walls, said segments having a peripheral sealing surface on an outer side and an end sealing surface on their outer end and a ramp on an underneath side inclined relative to the peripheral wall and the adjacent side wall, and a spring arrangeable in the slot having a center portion seating on the bottom of the slot and end portions engaging only said ramps so as to urge said pair of apex seal segments in directions bringing said peripheral sealing surfaces against the peripheral wall and also said end sealing surfaces against the respective side walls whereby a leakage gap is left only between the oppositely facing inner ends of said apex seal segments radially outward of the slot and the inner ends are supported by the bridge as they pass over the peripheral port.

3,981,644
SEALING STRIP PARTICULARLY FOR ROTARY ENGINES

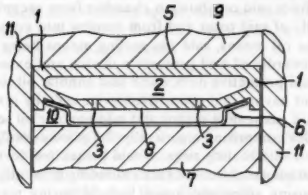
Josef Blum, Mulheim (Ruhr); Heinz Lamm, Esslingen-St. Bernhardt, and Alfred Sprang, Essen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany and Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, both of, Germany

Filed Jan. 29, 1975, Ser. No. 545,293

Claims priority, application Germany, Feb. 1, 1974, 2404770

Int. Cl.² F01C *19/02*

U.S. Cl. 418—122 **3 Claims**



1. A sintered hard metal sealing strip particularly for constituting a radial seal in a rotary internal combustion engine, the sealing strip including a body having a cavity extending longitudinally within the body and two longitudinal ends, the improvement comprising sintered hard metal end faces forming part of said body and closing off said cavity; both said ends being connected with the respective end face fixedly without transition.

3,981,645
DISPLACED PISTON MACHINE

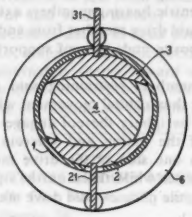
Hans Herzner, 3579 Schrecksbach/Holzburg, Eichmuhle, Germany

Filed Aug. 1, 1974, Ser. No. 493,929

Int. Cl.² F04C *17/18*

U.S. Cl. 418—161 **11 Claims**

1. A moving piston machine comprising: at least one piston received in a housing, at least one working chamber in said housing defined in part by a wall of the housing, an end face of the piston and opposed walls of a pair of guide members per piston, the guide members received in said housing, at least one of the guide members free to oscillate in the housing, the opposed walls of the guide members contacting opposite side walls of the piston, each of the opposed walls of the guide members and its contacted wall of the piston being coaxially arcuately curved, movement of the piston varying the size of the working chamber and moving at least one contacted guide member within the housing, and a guide member of each pair being firmly connected to a rotatable shaft means in a nonrelatively rotatable manner, the piston moving at a right angle to the rotation of the shaft means.



3,981,646
GEAR PUMPS AND MOTORS

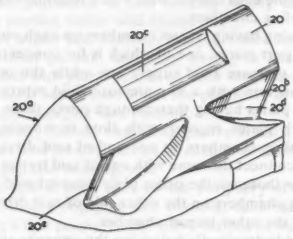
Harry Simister Bottoms, Solihull, England, assignor to Lucas Aerospace Limited, Birmingham, England

Division of Ser. No. 450,483, March 12, 1974, Pat. No. 3,953,160. This application Nov. 19, 1975, Ser. No. 633,562

Claims priority, application United Kingdom, Mar. 15, 1973, 12545/73

Int. Cl.² F04C *1/04, 15/00*

U.S. Cl. 418—190 **1 Claim**



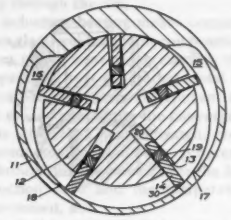
1. A gear pump or motor comprising a housing having therein an 8-shaped chamber with ports communicating with the chamber on opposite sides thereof, a pair of meshed pinion elements running in said 8-shaped chamber, and a shaft connected to one of the said pinion elements and projecting from the housing, each pinion element being supported in bearing blocks with non-planar surfaces forming relieved zones, each pinion element having a plurality of teeth each of which has a working flank, which engages the working flanks of teeth on the other pinion, and a non-working flank, each axial end portion of the non-working flank of each tooth of each pinion having a respective relieved portion adjacent its root, which relieved portion extends to the respective axial end of the non-working flank, and a further relieved portion adjacent its tip intermediate the axial ends of the non-working flank, each non-working flank having an unrelieved land extending across the entire width of the non-working flank from the root to the tip, said unrelieved land also including a longitudinal strip extending from one axial end of the non-working flank to the other at a position intermediate the root and the tip, and wherein the ports in the housing communicate with the inter-tooth spaces via the relieved zones in the bearing blocks and the relieved portions of the non-working flanks of the teeth at axial ends thereof.

3,981,647

PNEUMATIC VANE MOTOR

Knut Christian Schoeps, Tyreso, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Feb. 24, 1975, Ser. No. 552,331
Claims priority, application Sweden, Mar. 8, 1974, 7403166
Int. Cl.² F01C 21/00
U.S. Cl. 418—259 10 Claims



1. In a pneumatic vane motor comprising:

a cylinder provided with inlet and outlet openings for motive pressure air; a rotor eccentrically located within and rotatably journalled relative to said housing, said rotor comprising radial slots therein extending throughout the length thereof; and a plurality of vanes, each vane having an outer edge adapted to contact a wall of the cylinder, an inner edge adapted to be within a slot of said rotor and opposite faces defined between said outer and inner edges, respective vanes being disposed within said slots and arranged to be urged outwardly to urge their outer edges into contact with the cylinder wall, each of said vanes having a thickness defined between said opposite faces which is less than the width of the slot within which it is disposed;

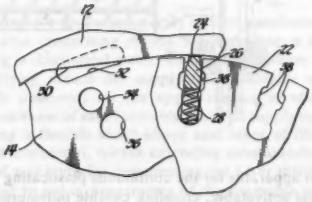
the improvement wherein each vane is provided with projections protruding from both of its opposite sides and spaced a substantial distance from its inner edge for preventing the vane from seating flatly on the slot walls and for substantially preventing the projections from being exposed to contact pressure between the vanes and the slot walls.

3,981,648

POWER TRANSMISSION

Kenneth T. Jordan, Madison Heights, and Norman A. Sowers, Lincoln Park, both of Mich., assignors to Sperry Rand Corporation, Troy, Mich.

Filed Oct. 23, 1974, Ser. No. 517,333
Int. Cl.² F01C 19/02
U.S. Cl. 418—267 1 Claim



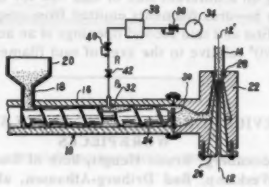
1. A hydraulic pump or motor unit of the rotary sliding vane type comprising a body formed by a non-circular cam ring and opposed end members having flat interior faces, inlet and outlet ports in the body, and further comprising a rotor having sliding engagement with the faces of the end members and being provided with generally radial slots and with vanes significantly narrower than the slots and radially reciprocable in the slots to contact the cam ring along its interior circumference, the unit having the improvement which comprises a hydraulic vane projection system utilizing in addition to the known fluid flow path between the sides of the slots and the sides of the significantly narrower vane and the known pressure feed holes in the end member faces communicating with the bottom of the slots, a widened portion in each slot intermediate its ends and a second set of pressure feed holes communicating with the widened portions of the slots.

3,981,649

APPARATUS FOR PRODUCING A FOAMED THERMOPLASTIC RESIN ARTICLE

Takashi Shimano; Katsumi Orimo; Shoji Yamamoto, all of Ichihara, and Masao Azuma, Chiba, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo

Filed Jan. 20, 1975, Ser. No. 542,396
Claims priority, application Japan, Jan. 22, 1974, 49-8985; Oct. 8, 1974, 49-115763
Int. Cl.² B29D 27/00
U.S. Cl. 425—4 C 6 Claims



1. An apparatus for producing a foamed thermoplastic resin article comprising an extruder including a barrel through which a thermoplastic resin is fed while being melted and a head to extrude said molten resin from said barrel to a lower pressure area, and gas injector means to inject a gas into said molten resin in said barrel through a gas injecting port in said barrel whereby said thermoplastic resin article is formed by extruding said gas containing molten resin, said injector means characterized by comprising gas flow rate setting means disposed adjacent and connected to said injecting port to conduct said gas therethrough while a constant gas flow rate is maintained irrespective of variation in the downstream pressure, and the volume of a gas passage from said gas flow rate setting means to said gas injecting port in said barrel being set sufficiently small for the gas pressure in said gas passage to respond to variation in the pressure of said molten resin in said barrel, said volume of said gas passage being less than 8 percent of the volume (at normal state) of said gas flowing through said gas flow rate setting means per minute.

3,981,650

MELT BLOWING INTERMIXED FILAMENTS OF TWO DIFFERENT POLYMERS

Robert E. Page, Davis, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Jan. 16, 1975, Ser. No. 541,504
Int. Cl.² B29F 3/04
U.S. Cl. 425—72 S 12 Claims

1. A plastic extrusion mechanism comprising in combination:

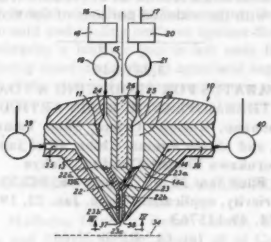
a die head having a first chamber for a first plastic and a second chamber for a second plastic;

a plurality of first small extrusion passages leading from the first chamber to first openings arranged in a row;

a plurality of second small extrusion passages leading from the second chamber to second openings in said row interspersed between said first openings;

first plastic delivery means connected to said first chamber for delivery of a first plastic thereto;

second plastic delivery means connected to said second chamber for delivery of a second plastic thereto said second plastic having different physical characteristics than said first plastic, and



first and second high velocity gas delivery means each one being on a different side of said row for directing a flow of air towards filaments emitted from respective ones of said first and said second openings at an angle between 0° and 90° relative to the axes of said filaments.

3,981,651
DEVICE FOR PRODUCING PLATE-SHAPED WORKPIECES

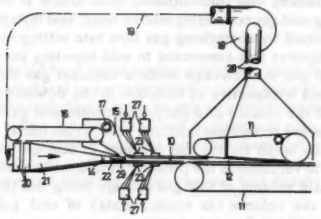
Adolf Buddenberg; Bruno Hengst, both of Bad Driburg, and Josef Weskamp, Bad Driburg-Alhausen, all of Germany, assignors to Adolf Buddenberg GmbH, Bad Driburg, Germany

Filed May 20, 1974, Ser. No. 471,690

Claims priority, application Germany, May 19, 1973, 2325508

Int. Cl.² B29C *13/00*; D01G *25/00*

U.S. Cl. 425—83 **15 Claims**



1. In a device for producing plate-shaped workpieces from comminuted material introduced by an air current into a forming chamber located downstream of a material supply channel, in supply direction of the material, the forming chamber being defined at upper and lower sides thereof by a pair of endless revolving conveyor and compression belts spaced from and located above one another, one of the belts being formed with air passage openings therein, the improvement therein comprising a separate material supply channel and air blow channel which come together with an adjustable air flow regulator, in the air blow channel, which terminates at the juncture of the air blow channel and the material supply channel, a fleece-forming and supply channel connected to and forming an extension of said air flow channel, and a plurality of injector nozzle means spaced from and located downstream of said air flow regulator for moving the fleece through the fleece-forming and supply channel to the forming chamber and for orienting the comminuted material.

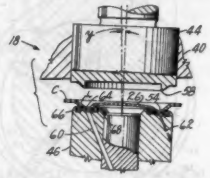
3,981,652
MACHINE FOR PARTLY COATING ARTICLES

Walter C. Lovell, Wilbraham, and Frederick G. J. Grise, Magnolia, both of Mass., assignors to USM Corporation, Boston, Mass.

Filed Aug. 5, 1974, Ser. No. 494,985

Int. Cl.² A23G *1/20*

U.S. Cl. 425—111 **15 Claims**



2. A coating device for treating portions of generally planar sheet metal lids having a disruptable closure defining ridge on one side of the respective lids and a complemental groove formed respectively on the opposite side of the lids between the walls of said ridge, said device comprising a movable back-up die having axially protruding work engaging surfaces respectively shaped to nest in said complemental groove of the closure and bear on the periphery of the lids, and an applicator registerable and cooperative with the die and having laterally spaced masking edges arranged, respectively, to nip and mask the walls of the closure ridge when the die and applicator are relatively moved together, said applicator having an open cavity bounded by the masking edges for receiving pressure fluid sealant when the closure ridge is thus nipped by the masking edges.

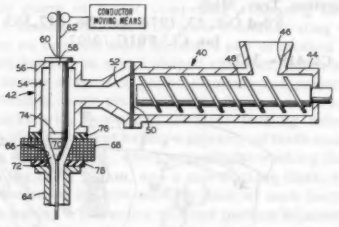
3,981,653
APPARATUS FOR THE MANUFACTURE OF AN ELECTRICAL CONDUCTOR COVERED WITH A CROSSLINK CURED POLYMERIC INSULATION

Milton Sharples Greenhalgh, and Ray Clarence Lever, both of Fairfield, Conn., assignors to General Electric Company, New York, N.Y.

Filed Jan. 3, 1975, Ser. No. 538,353

Int. Cl.² B29F *3/08*

U.S. Cl. 425—113 **7 Claims**



1. An apparatus for the continuous plasticating and heating of a heat activatable, crosslink curable polymeric compound and forming therefrom a crosslink cured polymeric insulating covering about a moving elongated electrical conductor, comprising:

a. plastic forming means comprising an extruder barrel having an outlet passage at one end leading to a channel die having a converging entry thereto for the continuous molding of plastic polymeric material progressively moving therethrough;

b. means located upstream of said die for continuously moving an elongated electrical conductor through the channel die;

c. means comprising a rotatable extruder screw within the extruder barrel for plasticizing and continuously progressively moving a heat activatable, crosslink curable polymer compound into and through the converging entry and channel die and thereby continuously molding said curable polymer compound about the elongated conductor moving through the die;

d. electrical induction heating means comprising a combination of an electrical induction coil positioned surrounding the area of the converging entry to the channel die and a cooperating heat generating metal induction core member positioned substantially concentrically encircled within and spaced apart from the converging entry to the channel die whereby a heat activated, crosslink curable polymer compound continuously progressively moving into and through the die passes over the heat generating metal induction core and the temperature thereof is abruptly increased; and

e. thermal insulating means isolating the heat generating metal induction core from other components of the apparatus to thereby confine the heating of the continuously progressively moving heat activated, crosslink curable polymer compound to the portion thereof entering into the channel die.

3,981,654

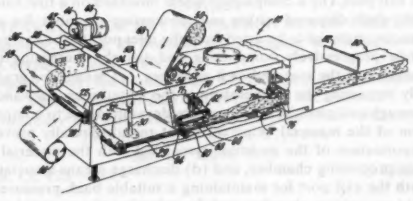
APPARATUS FOR PRODUCING FIBER REINFORCED ORGANIC FOAM

Leonard D. Rood, Columbus, and Ronald E. Kissell, Alexandria, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 338,486, March 6, 1973, Pat. No. 3,867,494. This application Nov. 13, 1974, Ser. No. 523,383

Int. Cl.² B29D *27/04*

U.S. Cl. 425—115 **5 Claims**



1. Apparatus for producing a body of fiber-reinforced foam, said apparatus comprising means for supplying a layer of fibers along a horizontal path, means downstream of said fibers supplying means for supplying a foamable material substantially uniformly on the upper surface of said layer, means downstream of said foamable material supplying means for supplying a flexible sheet above said layer of fibers and said foamable material, means extending substantially across the width of said layer for compressing the layer through said flexible sheet to aid in penetration of the foamable material, and means downstream of said compressing means to subsequently restrict the extent of the rise of the foamable material during foaming, said compressing means comprising a plurality of rolls, means connected to said rolls for supporting said rolls transversely to the path of said layer with their axes parallel, and means connected to said rolls for rotating said rolls in a circular path with the rolls closest to said layer moving in the same direction as said layer.

3,981,655

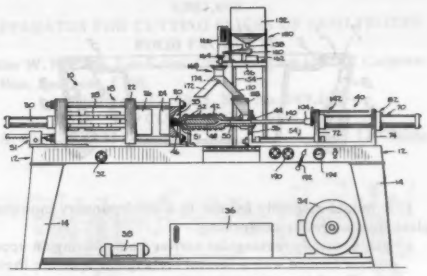
MOLDING APPARATUS SELECTIVELY OPERABLE FOR EITHER INJECTION OR TRANSFER MOLDING

Stephen Horbach, 40 Glen Road, Mountain Lakes, N.J. 07046

Filed Jan. 15, 1975, Ser. No. 541,213

Int. Cl.² B29F *1/00;* **B29G** *3/00*

U.S. Cl. 425—181 **4 Claims**



1. A dual mode molding apparatus comprising:

a frame,

first and second laterally spaced platens mounted on said frame, at least one of said platens being movable relative to said frame, said platens being reciprocally movable relative to one another,

cavity mold pieces mounted on said platens and disposed to form a closed mold upon relative movement of said platens toward each other and to open the mold upon relative movement of said platens away from each other,

said first platen including a first through opening in communication with the mold cavity defined by said mold when in said closed state,

a removable first mode feed cylinder having a second through opening, said first mode feed cylinder adapted to be mounted adjacent said first platen and, when so mounted, said second through opening being in communication with said first through opening,

a removable second mode feed cylinder having heating means and an outlet nozzle, said second mode feed cylinder adapted to be mounted adjacent said first platen,

a removable sprue adapted to be inserted in said first through opening,

said sprue mating with said nozzle when said sprue is so inserted and when said second mode feed cylinder is so mounted,

a plunger mounted on said frame for reciprocal lateral movement, and

means operatively connected to said plunger for adjusting the stroke of said plunger to provide first and second stroke modes for said plunger,

when said first mode feed cylinder is so mounted and said plunger is in said first stroke mode, said plunger having a stroke that extends through said second through opening and through said first through opening into said mold,

when said second mode feed cylinder is so mounted and said plunger is in said second stroke mode, said plunger having a stroke that extends partially into said second mode feed cylinder,

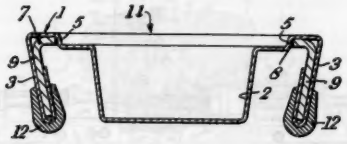
the stroke of said plunger in said second mode being substantially less than the stroke of said plunger in said first mode.

3,981,656

MOULDING OF HIGH BOILED SUGAR AND LIKE CONFECTIONS

Gordon Steels, Peterborough, and Terence John Blore, Deeping St. James, near Peterborough, both of England, assignors to Baker Perkins Holdings Limited, Great Britain

Filed Apr. 18, 1975, Ser. No. 569,392
Claims priority, application United Kingdom, Apr. 22, 1974, 17523/74
Int. Cl.² A23G 3/12
U.S. Cl. 425—182 5 Claims



1. A mould assembly for use in a confectionery moulding plant, said assembly comprising

a rigid, generally rectangular carrier frame having an upper portion formed with a central rectangular aperture therethrough and opposed depending side flanges extending downwardly with respect to said upper portion, said carrier frame also having end portions thereon adapted so as to enable attachment of said mould assembly to spaced driving chains in said moulding plant,

a mould constituted of a generally rectangular sheet of thin, flexible plastic material, said sheet having a central rectangular, recessed portion which is located within said aperture in said carrier frame, being formed with at least one moulding cavity extending downwardly through said aperture, and also having opposed depending side flanges which extend alongside outer surfaces of said side flanges on the carrier frame, said mold flanges having lower portions which are bent upwardly to extend alongside inner surfaces of the side flanges of the carrier frame, and

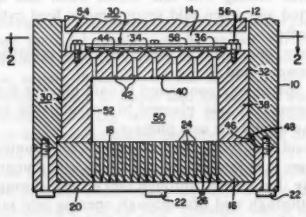
clips of U-shaped cross-section which are fitted over said side flanges on the mould to thereby removably attach them to the side flanges on the carrier frame.

3,981,657

IN-LINE HOMOGENIZING OF EXTRUDABLE CERAMIC BATCH MATERIALS

Francis L. Orso, and Giacomo J. Piazza, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 398,379, Sept. 18, 1973, Pat. No. 3,888,963. This application Feb. 19, 1975, Ser. No. 551,135
Int. Cl.² B28B 3/24
U.S. Cl. 425—198 2 Claims



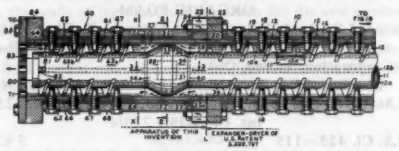
1. In extrusion apparatus including an extrusion cylinder, an extrusion die on the outlet end of said extrusion cylinder, and a reciprocal plunger within said cylinder for extruding successive charges of ceramic batch material through said extrusion die into ceramic articles, the improvement comprising means positioned within said extrusion cylinder upstream of said extrusion die for initially breaking up and dissipating interfacial discontinuities in said batch material and then for compacting such material into a continuous homogeneous slug of batch material prior to being extruded through said extrusion die, said means including a flow homogenizer positioned within said extrusion cylinder, said flow homogenizer having substantially cylindrical outer sidewall portions conforming to inner wall portions of said extrusion cylinder and an upper wall portion extending across said sidewall portions forming a compaction chamber within said flow homogenizer between said sidewall and upper wall portions, a plurality of passages extending through said upper wall portion communicating between the interior of said extrusion cylinder and said compaction chamber, said passages extending diagonally through said upper wall portion and forming mixing means for laterally transposing batch material fed therethrough to an offset position within said compaction chamber relative to its initial orientation in said extrusion chamber.

3,981,658

SCREW TYPE APPARATUS FOR DRYING MOIST POLYMERIC MATERIALS

George Oliver Briggs, West Lake, Ohio, assignor to International Basic Economy Corporation, New York, N.Y.

Division of Ser. No. 217,744, Jan. 14, 1972, abandoned. This application Jan. 23, 1975, Ser. No. 543,492
Int. Cl.² B29F 3/06
U.S. Cl. 425—205 4 Claims



1. In an apparatus for drying moist polymeric material including (a) a processing chamber having an inlet port and an exit port, (b) a compaction worm mounted on a first rotatable shaft disposed within said processing chamber for advancing material to be dried from the inlet port to the exit port while progressively compacting and thereby increasing the pressure of the material as it advances, (c) means for gradually increasing the temperature of the material as it advances through said chamber, the pressure developed due to compaction of the material being sufficient to substantially prevent vaporization of the moisture associated with the material in said processing chamber, and (d) discharge means associated with the exit port for maintaining a suitable back-pressure in said processing chamber and for releasing the material to a relatively low pressure environment as compared to the pressure developed in said processing chamber, the improvement in said discharge means comprising:

1. a cylindrical conduit having an inlet port and an exit port, the inlet port of said conduit communicating with the exit port of said processing chamber;

2. a second rotatable cylindrical shaft mounted concentrically in said conduit and connected to said first shaft for rotation in unison therewith, said second shaft having diameter substantially less than the inside diameter of said conduit;

3. valve means associated with an intermediate portion of said conduit for providing a passageway of controllable cross-sectional area from the portion of said conduit upstream of said valve means to the portion of said conduit downstream of said valve means including:

3a. an obstruction mounted on said second shaft, said obstruction having a smooth cylindrical outer surface concentric with said second shaft, the diameter of said obstruction being substantially greater than the diame-

ter of said second shaft but less than the inside diameter of said conduit;

3b. at least one valve housing mounted externally of said conduit and containing a valve chamber continuously communicating with the interior of said conduit from a region upstream of said obstruction to a region downstream of said obstruction;

3c. a valve member slidably disposed in said valve chamber for radial motion with respect to said conduit for controlling the volume of said valve chamber communicating with said conduit to control the cross-sectional area of said passageway; and

3d. means associated with said valve member for controlling the position of said valve member in said valve chamber; and

4. means associated with the portion of said conduit downstream of said valve means for releasing the material exiting from said passageway to said relatively low pressure environment within said downstream portion of said conduit to permit substantially all of the moisture associated with the material exiting from the passageway to immediately vaporize and immediately expand the material to the full extent required for said vaporization, thereby drying the material, and for compacting and advancing the dried material to the exit port of said conduit under pressures sufficiently low to prevent substantial recondensation of the vapor on the dried material including:

4a. a plurality of worms spaced longitudinally on said second shaft downstream of said obstruction to form an interrupted compaction worm flight for advancing the dried material to the exit port of said conduit and progressively compacting the dried material as it advances without creating a substantial pressure difference between the exit port of said conduit and the downstream end of said passageway during compaction and advance of the material; and

4b. a plurality of breakers mounted on said conduit and projecting into the interior of said conduit intermediate at least some of said worms to prevent the dried material from rotating with the worms.

3,981,659

APPARATUS FOR DRYING CARBON BLACK PELLETS

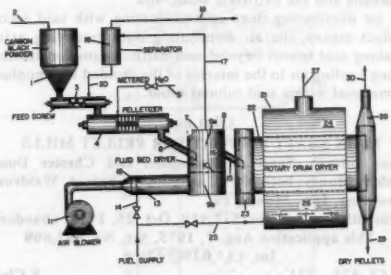
Claude V. Myers, El Dorado, Ark., assignor to Cities Service Company, Tulsa, Okla.

Division of Ser. No. 47,085, June 17, 1970, Pat. No. 3,740,861. This application July 16, 1971, Ser. No. 163,463

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² C09C *1/58*

U.S. Cl. 425—222 **5 Claims**



1. Apparatus for producing dry pellets of carbon black comprising:

a. carbon black wet pelletizer,

b. a fluid bed dryer adapted to receive pellets which are discharged from said pelletizer, a conduit connecting said pelletizer and said dryer for directing said pellets from the pelletizer to the fluid bed dryer

c. a rotary drum dryer adapted to receive pellets which are discharged from said pelletizer and a conduit connecting said fluid bed dryer and said rotary drum dryer for directing said pellets from the fluid bed dryer to the rotary drum dryer.

3,981,660

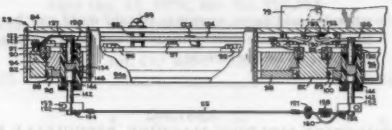
APPARATUS FOR CUTTING SLICES OF SEMI-FROZEN FOOD PRODUCTS

Peter W. Forcella, Los Gatos, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 12, 1975, Ser. No. 549,264

Int. Cl.² A23G *9/28, 9/14*

U.S. Cl. 425—232 **12 Claims**



1. Apparatus for forming slices of a food product such as semi-frozen ice cream or the like, comprising:

a. a vertical axis extrusion nozzle for extruding a substantially vertical column of the product;

b. a first rotatable member comprising an annulus that surrounds the lower end of said nozzle;

c. a second rotatable member laterally adjacent said first member;

d. means operatively associated with said rotatable members for driving both members in a common direction and at the same angular velocity;

e. means for rotatably mounting a wire clamp on each member, the two clamps being equally spaced from the axes of their respective members and being positioned so that the distance between the clamps remains constant during rotation of said members;

f. a heated cutoff wire anchored to said wire clamps to cut the unsupported extruded product column and sever an individual slice, and

g. a conveyor movable beneath said nozzle for receiving product slices.

3,981,661

INJECTION CYLINDER UNIT, MOLD AND MOLD HANDLING APPARATUS

Don Allen Taylor, Box 4, 216 Mills St., Wadsworth, Ohio 44281

Continuation of Ser. No. 411,793, Nov. 1, 1973, abandoned. This application May 27, 1975, Ser. No. 580,909

Int. Cl.² B29C *3/02*

U.S. Cl. 425—247 **19 Claims**

1. An injection cylinder unit, mold, and mold-handling apparatus in combination with a compression press having a frame and relatively movable upper head and bottom bolster with upper and lower platens attached thereto, comprising;

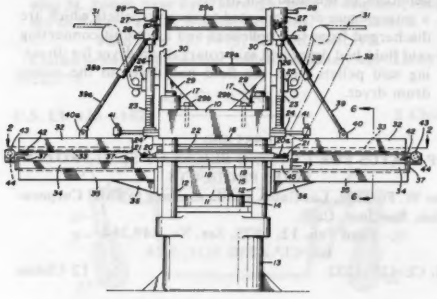
A. at least one vertically disposed material heating, plasticizing and injection cylinder assembly disposed adjacent to the frame of the compression press exteriorly thereof;

B. a material distributing and storing manifold communicating with said injection cylinder;

C. said manifold having at least one material outlet sprue;

D. at least one multi-cavity mold having a plurality of sprue openings therein for communication with said material outlet sprue of said manifold; and

E. means connected to said mold for incrementally indexing said mold from a position between the upper and lower platens of said press to a position exteriorly thereof



whereby said sprue openings of said mold can be selectively moved into communication with said material outlet sprue of said manifold.

3,981,662

INJECTION-MOLDING MACHINE, ESPECIALLY FOR THERMOSETTING OR THERMALLY CROSS LINKABLE SYNTHETIC RESINS

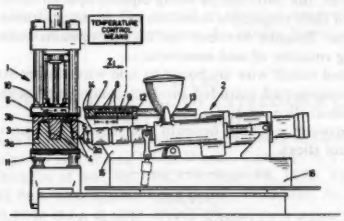
Friedrich Bernd Bielfeldt, Aidenried, and Klaus Händler, Puchheim-Bhf, both of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Dec. 27, 1971, Ser. No. 212,186

Claims priority, application Germany, Dec. 31, 1970, 2064670

Int. Cl.² B29F *1/022*

U.S. Cl. 425—247 **10 Claims**



1. An injection-molding system for a thermally sensitive moldable material, comprising a separable mold having at least two mold members defining at least one mold cavity and formed with at least one channel communicating with said cavity and opening at a surface of the mold perpendicular to a mold-opening and mold-closing direction; mold-closing means for retaining said mold members under pressure in said direction; a material-distribution plate separate from said mold members and alignable with said surface, displaceable transversely to said direction and provided with at least one throughgoing distribution passage communicating with said channel in an inserted position of said plate; means for selectively inserting said plate into the effective path of said mold-closing means and fully withdrawing said plate from alignment with said surface and out of the effective path of said mold-closing means and fully out of heat communication with said mold; and injection means for injecting said material into said passage of said plate at least in said inserted position thereof.

3,981,663

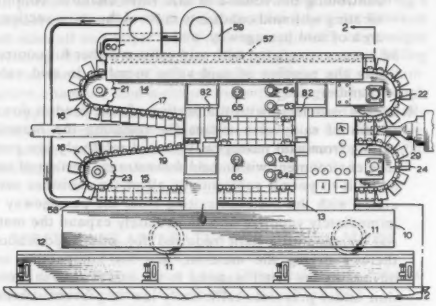
APPARATUS FOR MAKING HIGH SPEED CORRUGATED PLASTIC TUBING

Gerd P.H. Lupke, 46 Stornoway Crescent, Thornhill, Ontario, Canada (L3T 3X7)

Continuation-in-part of Ser. No. 396,100, Sept. 10, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,231

Int. Cl.² B29F *3/08*

U.S. Cl. 425—326 B **14 Claims**



1. A high speed corrugator for producing corrugated thermoplastic tubing, comprising:

a pair of complementary mold assemblies each comprising an endless chain of articulately interconnected mold blocks and means for guiding the mold blocks along an endless track having a forward run and a return run,

each mold block being complementary to a respective mold block of the other assembly, said mold blocks cooperating in pairs along said forward run to form an axially extending tunnel defining a tubular mold having a corrugated wall,

means associated with said assemblies for driving said endless chains in synchronism for progressively moving the mold blocks along said endless tracks,

an extrusion head adapted to be fitted to the nozzle of an extrusion machine for forming a tube of thermoplastic material therefrom,

means positioning the mold assemblies so as to locate the extrusion head at the entrance to said tunnel coaxially therewith,

said extrusion head including first duct means for introducing pressurized air to the interior of the extruded tube for expanding the tube to conform to the wall of the tubular mold, and second duct means separate of said first duct means for the passage of cooling air,

baffle means spaced axially from the extrusion head for maintaining a pressurized air space between said baffle means and the extrusion head, and

an air distributing duct communicating with said second duct means, the air distributing duct extending axially along said tunnel beyond said baffle means for distributing cooling air to the interior of the molded thermoplastic material within said tubular mold.

3,981,664

MAIN SHAFT SUPPORT FOR PELLET MILLS

Oszkar Bittner, South Williamsport, and Chester Donald Fisher, Muncy, both of Pa., assignors to Sprout, Waldron & Company, Inc., Muncy, Pa.

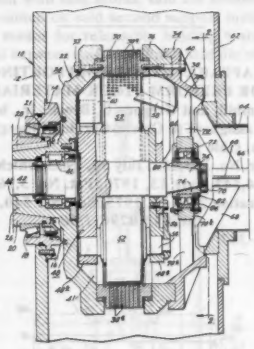
Continuation of Ser. No. 517,910, Oct. 25, 1974, abandoned. This application Aug. 7, 1975, Ser. No. 602,808

Int. Cl.² B29C *17/14*

U.S. Cl. 425—331 **8 Claims**

1. In a pellet mill comprising a base, a die housing mounted on said base, an annular die and die cover secured to said die housing, said die housing, die and die cover defining a pelleting chamber therewithin, a main shaft supported concentrically within said die housing and extending into said pelleting

chamber, a roller support frame extending from said main shaft, a plurality of rollers rotatably supported on said roller support frame in contiguous cooperative relation with said die, means on said die housing and main shaft providing relative rotation of said die housing, die and die cover with respect to said main shaft, roller support frame and rollers, means adjacent said die cover for conveying material to be pelleted into said pelleting chamber, and means on said roller support frame for directing material to be pelleted into the nips of said



rollers, the improvement comprising means for resolving the radial forces developed between said rollers and said die during pelleting operations, said latter means comprising an extension of said main shaft beyond said roller support frame, support means extending between said die cover and said main shaft extension and including bearing means permitting relative rotation of said die cover and said main shaft extension, said support means being apertured to permit the passage of material to be pelletized therethrough.

3,981,665

PRESS HAVING TORQUE RESPONSIVE DRIVE COUPLING

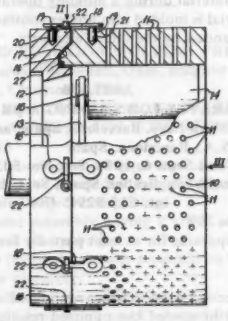
Robert Spencer, Stroud, England, assignor to Simon-Barron Limited, Gloucester, England

Filed Oct. 2, 1975, Ser. No. 619,009

Claims priority, application United Kingdom, Nov. 9, 1974, 48588/74

Int. Cl.² B28B *3/12*

U.S. Cl. 425—331 **14 Claims**



1. A press of the kind for the preparation of pellets of cattle feed or other pelletisable material and comprising an annular die having a plurality of radial bores therein, which is mounted on a driving rim for rotation around a stationary support fitted with a number of pressure rollers, each freely rotatable on a stationary shaft and in closely spaced relationship with the interior surface of the die, the arrangement being such that material fed into the interior of the die is forced through the bores therein by the action of said pressure rollers, characterised in that the die and driving rim therefor are provided with complementary circumferential mating male and female surfaces, there being a plurality of circumferentially spaced links each of which is arranged to be pivotally connected at its opposed ends to the driving rim and die respectively such that transmission of torque from the driving rim to the die causes pivoting movement of said links to bring said mating surfaces into pressurised engagement.

3,981,666

COMPRESSION DEVICE

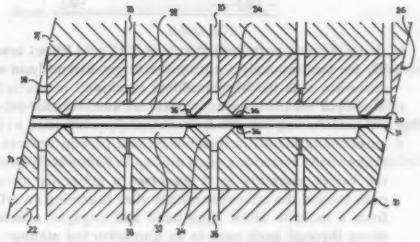
Sipke Sikke Wadman, Burg. Bartelstraat 6, Hoogezand, Netherlands

Filed Oct. 17, 1974, Ser. No. 515,553

Claims priority, application Netherlands, Oct. 30, 1973, 7314849

Int. Cl.² B29C *15/00*

U.S. Cl. 425—371 **6 Claims**



1. In a compression device comprising two continuously circulating belts between which a layer of material is to be conditioned under pressure, the improvement comprising:

a pair of supporting bodies mounted on said device, between which both said belts pass in spaced-apart relationship, thereby defining a space for conditioning said material between said belts;

each of said supporting bodies having

a plurality of first recesses facing a respective belt and defining pressurized fluid sources,

a plurality of second recesses facing a respective belt and defining fluid discharge means, and

unobstructed gaps between the respective belts and the portions of said supporting bodies between recesses;

whereby fluid can flow out of said fluid sources, through said gaps, and into said discharge means, in order to maintain a fluid film between said moving belts and said portions of said supporting bodies between recesses.

3,981,667

TAKEOUT APPARATUS FOR A BLOW MOLDING MACHINE

Richard D. Bilodeau, North Stonington, Conn., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 492,001, July 26, 1974. This application Jan. 31, 1975, Ser. No. 545,927

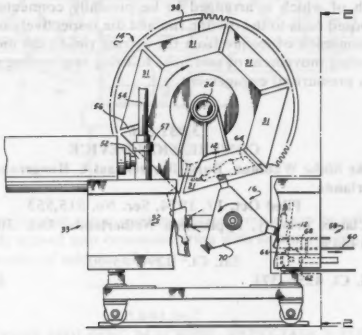
Int. Cl.² B29D *23/03*

U.S. Cl. 425—387 B **8 Claims**

1. Takeout and transfer apparatus in combination with a blow molding machine which is vertically disposed on framework and includes a plurality of molds circularly arranged about a horizontal axis, each mold comprising partible sec-

tions openable and closeable parallel to said axis, said apparatus comprising:

a. a vertically oriented turret assembly located within said framework generally adjacent a five o'clock position with respect to the circular arrangement of the molds when viewing the machine from the front side, said assembly including a plurality of article pickup devices each of which includes a telescopically mounted pickup head for receiving articles from the molds;



b. drive means operatively connected to said turret assembly for continuously rotating the turret assembly in synchronism with the blow molding machine;

c. conveyor means adjacent the turret assembly for receiving and transferring articles from the pickup heads;

d. positioning means connected to said pickup devices for sequentially retracting each pickup head inwardly toward the turret assembly as it traverses a generally circular path toward the conveyor means after receiving an article from a mold to allow each head and engaged article to move through such path in an unobstructed manner.

3,981,668

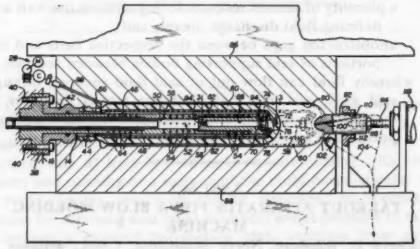
APPARATUS AND METHOD FOR LONGITUDINAL STRETCH FOR BLOW MOLDING

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Greenbrook, N.J.

Division of Ser. No. 441,811, Feb. 12, 1974, Pat. No. 3,905,738. This application Jan. 31, 1975, Ser. No. 545,933

Int. Cl.² B29D *23/03*

U.S. Cl. 425—387 B **4 Claims**



1. Blow molding apparatus including in combination a core rod, an elastic balloon attached to the core rod at the neck end thereof, the balloon hugging the core rod when the balloon is in a deflated condition preparatory to having a parison applied over the outside surface of the balloon, and an end portion of the core rod remote from the neck end of the rod and that moves axially to extend the length of the core rod so that the balloon and the parison thereon are stretched lengthwise, characterized by the core rod being carried by one face of an indexing head that has a plurality of other faces that carry similar core rods and that move each rod successively to an injection station, characterized by the apparatus including two conditioning stations, means at the first conditioning station for partially blowing the balloons and parisons of successive core rods to move each balloon out of contact with its core rod, and means at the second conditioning station for actuating the movable portion of the core rods, characterized by temperature control means at the conditioning stations for maintaining the temperature of the parison within the orientation range.

3,981,669

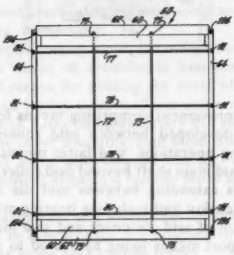
MOLDING APPARATUS WITH SUPPORTING FRAME FOR PREFORM STOCK MATERIAL

Ulysses T. Gambill, and Gregory C. Brock, Jr., both of Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 383,854, July 30, 1973, which is a division of Ser. No. 54,541, July 13, 1970, Pat. No. 3,764,243. This application Jan. 10, 1975, Ser. No. 540,041

Int. Cl.² B29C *1/00*

U.S. Cl. 425—397 **4 Claims**



1. In a molding apparatus, means for supporting a quantity of moldable fibrous material during a molding operation comprising a rectangular metal frame having tubular end frame members and side rails, each of said end frame members having an outwardly-projecting strip integrally joined therewith providing an end rail, a plurality of spaced linear elements connected with the end frame members, a plurality of spaced linear elements connected with the side rails, said linear elements connected with the end frame members being in crossing relation with the linear elements connected with the side rails, said linear elements providing support means for the fibrous material during a molding operation in which the fibrous material is molded into bodies substantially defined by the areas bounded by the linear elements.

3,981,670

APPARATUS FOR SHAPING A BRASSIERE

Jean Michel Bloch Levy, Barcelona, Spain, assignor to Central Corsetera S.A., Barcelona, Spain

Filed Sept. 6, 1974, Ser. No. 503,667

Claims priority, application Spain, Sept. 10, 1973, 418621

Int. Cl.² B29C *3/00*

U.S. Cl. 425—398 **10 Claims**

1. In an apparatus for at least partially forming a brassiere, comprising:

a frame;

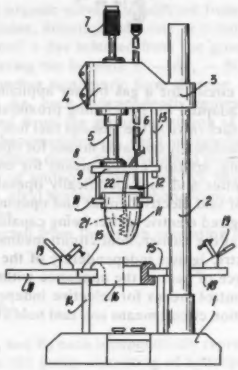
first and second support means mounted on said frame and disposed in spaced but opposed relationship to one another;

shaping means for simultaneously shaping the cups of a brassiere from a sheet of flexible material;

said shaping means including a pair of identical cup-shaped male molds disposed adjacent one another, each said mold having a substantially conical outer surface adapted to engage and deform the material therearound so that the molds form a pair of cups in said material, said molds being movably supported on said first support means for permitting the spacing between said molds to be selectively varied;

said shaping means further including die means defining therein a pair of adjacent circular openings which extend through said die means and are disposed in substantial alignment with said molds, said die means being removably mounted on said second support means;

clamping means for releasably holding a sheet of flexible material between said molds and said die means with said



sheet being disposed directly adjacent said die means and extending across the openings thereof;

said shaping means also including heating means associated therewith for heating said flexible material as deformed by said molds; and

drive means drivingly connected to one of said support means for causing reciprocating movement thereof between two end positions in a direction toward and away from the other of said support means, said one support means when in one of said end positions resulting in said molds being completely withdrawn from said openings and spaced from said die means, and said one support means when in the other of said end positions resulting in said molds projecting through said openings so as to deform the flexible material extending thereacross.

3,981,671

LIQUID REACTION MOLDING PRESS

Bobbie Lee Edwards, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Sept. 22, 1975, Ser. No. 615,351

Int. Cl.² B29C *5/00;* **B29D** *27/04*

U.S. Cl. 425—453 **15 Claims**

1. A clamp for mounting mating parts of a mold in the mold cavity of which may be reacted an organic liquid molding to form a solid molded object comprising:

a C-shaped frame assembly having a lower jaw connected by a column to an upper jaw;

a mold support (crown) pivotally mounted on the upper jaw of said frame assembly;

a pedestal and floor plate assembly;

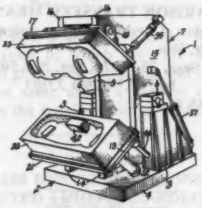
means revolvably supporting said C-shaped frame assembly from said pedestal and floor plate assembly;

a mold bed support (bed) pivotally mounted on the lower jaw of said frame assembly;

pivotal mounting means for said crown and bed located on substantially parallel axes; and

a movable platen reciprocably mounted on one of said bed and said crown;

said crown and said movable platen being adapted to support thereon respective parts of said mold and position-



able so that the mold is closed when the crown and bed are substantially parallel and said platen has been advanced to where the mold parts are engaged and said mold is opened by retracting said platen and pivotally swinging both said bed and crown away from the column portion of said frame assembly.

3,981,672

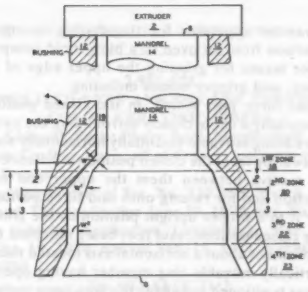
APPARATUS FOR FORMING A PARISON

Newton R. Wilson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 338,250, March 5, 1973, Pat. No. 3,914,366. This application Dec. 10, 1974, Ser. No. 531,448

Int. Cl.² B29D *23/04*

U.S. Cl. 425—467 **6 Claims**



1. A die for forming a parison of blow-moldable material, said die having first and second open ends, a bushing and a mandrel positioned within the bushing, said mandrel and bushing each being of dimensions forming an annulus therebetween, said annulus having first, second, and third annular zones along its axis from the entrance end toward the exit end of the die, the first annular zone being of a generally uniform first width and of a generally circular cross-section, the second annular zone having first and second diametrically opposed portions each being of a greater second width than said first width, the second width of each first and second portion progressively decreasing in a clockwise and a counterclockwise direction from a median locus of said first and second portions, the directions being taken at right angle to the axis of the mandrel, the second width of each of said first and second portions along the length of said second annular zone progressively increasing in an upper portion of said second annular zone and then decreasing in a lower portion of said second annular zone in a direction from the entrance end

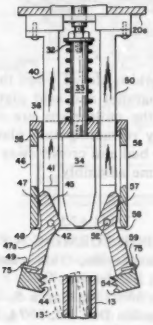
toward the exit end of the die, and said third annular zone being of a generally uniform third width, said third width being less than the second width taken along the length of said second annular zone.

3,981,673

PARISON TRANSFER MEANS

Nickolas N. Sokolow, Cheshire, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed Sept. 25, 1974, Ser. No. 509,150
Int. Cl.[2] B29D *23/03*
U.S. Cl. 425—455 R 4 Claims



1. A transfer apparatus for transferring an open ended tubular parison from an oven to a blow mold comprising:

a gripper means for gripping the upper edge of a tubular parison, said gripper means including

at least three jaws which, in the closed position, form essentially a circle closely surrounding the parison, said jaws being movable essentially horizontally and radially outwardly from the closed position a distance sufficient to receive between them the upper end of a tilted parison and for closing onto said tilted parison to center it to a proper upright position as the jaws move to the closed position; said jaws being mounted for pivotal movement about a horizontal axis located thereabove;

a vertically movable ring member having operative surfaces positioned to engage the jaws upon vertical movement relative to the jaws to open and close the jaws;

a push piece having a tapered lower end; means for positioning the push piece for vertical movement into the opened upper end of the centered parison to firmly secure the parison between the jaws and the push piece including a vertical rod, said push piece forming the lower end of said rod and said ring member being cylindrical and having an upper support surface and surrounding the rod and being movable vertically relative to the rod;

means associated with said ring member limiting both the downward and the upward movement of the ring member relative to the push piece;

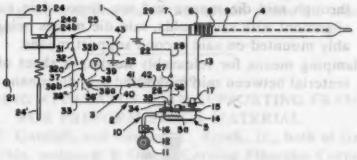
resilient means acting between the rod on the push piece and the ring support surface urging the ring to its lowermost position relative to the push piece at which lowermost position the jaws are opened, and from which position upward movement of the ring relative to the push piece opposes the resilient means and causes the jaws to close.

3,981,674

CONTROL CIRCUIT AND ADJUSTABLE VALVE FOR A GAS APPLIANCE

Richard L. Perl, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Filed June 5, 1975, Ser. No. 583,985
Int. Cl.[2] F23H *5/24*
U.S. Cl. 431—67 15 Claims



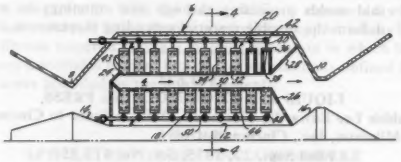
1. A control circuit for a gas burner appliance having an electric igniter adapted for positioning proximate the burner port area and a fuel valve in the gaseous fuel line to the burner and including electrically operable means for opening the fuel valve, comprising: ignition circuit means for energization of said electric igniter and said electrically operable means to effect heating of said electric igniter and opening of said fuel valve, said energized electric igniter being capable of effecting ignition of fuel at the burner, hold circuit means for energization of the electric igniter independently of the fuel valve to maintain a source of heat in the appliance without fuel combustion, and control means for selective independent operation of said ignition circuit means and said hold circuit means.

3,981,675

CERAMIC BURNER CONSTRUCTION

Eugene J. Szetela, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1974, Ser. No. 534,313
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.[2] F23C *5/28*
U.S. Cl. 431—175 12 Claims



1. A burner construction including:

a substantially cylindrical surrounding outer wall;

an inner wall spaced from and enclosed by said outer wall, said inner wall having a plurality of holes therein; and

a plurality of individual burner cans mounted on said inner wall, each burner can having a perforate sidewall and having a fuel nozzle opening at one end, and having the other end attached to one of the openings in the inner wall with the axis of each individual burner extending substantially at right angles to the inner wall, said burners being totally within the cylindrical outer wall.

3,981,676

LYOPHILIZED DYES AND THE USE THEREOF TO COLOR KERATINIC FIBERS

Giuliana Ghilardi, Paris; Pierre Bore, Montfermeil, and Jean-Francois Grollier, Paris, all of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 120,353, March 2, 1971, abandoned. This application June 25, 1973, Ser. No. 372,933

Claims priority, application Luxemburg, Mar. 3, 1970, 60449; Oct. 19, 1970, 61890; Feb. 15, 1971, 62596; June 26, 1972, 65589

Int. Cl.² A61K 7/12

U.S. Cl. 8—10 **9 Claims**

1. A process for preparing a lyophilized dye composition for coloring hair comprising freezing at a temperature of about −200° to −60°C a solution consisting essentially of, in an organic solvent or an aqueous solution of said organic solvent wherein said organic solvent is selected from the group consisting of dioxane, dimethyl sulfoxide, tert-butyl alcohol and a mixture thereof, a dye selected from the group consisting of

a. a dye having the formula Y — Ar_1 — N = Ar_2 = X or a corresponding tautomeric form thereon, wherein

Ar_1 and Ar_2 each independently represents a member selected from the group consisting of phenyl, pyridyl and phenomorpholine, each optionally substituted by an electron donor group selected from the group consisting of amino, hydroxy, alkoxy having 1–4 carbon atoms, alkyl having 1–4 carbon atoms, acetylamino and halogen,

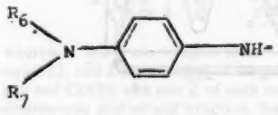
Y is selected from the group consisting of hydroxy and

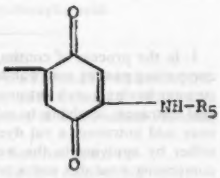
wherein R_1 and R_2 each independently represents a member selected from the group consisting of hydrogen, alkyl having 1–4 carbon atoms and acetylaminoalkyl wherein the alkyl moiety has 1–4 carbon atoms, and

X represents a member selected from the group consisting of oxygen, imine and iminium;

b. a salt of (a) above; and

c. 2,5-diamino-1,4-benzoquinone of the formula:

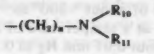




wherein

R_3 represents a member selected from the group consisting of hydrogen and hydroxyalkyl having 1–4 carbon atoms, and

R_4 and R_7 each independently represents a member selected from the group consisting of alkyl having 1–4 carbon atoms, hydroxyalkyl having 1–4 carbon atoms and aminoalkyl of the formula



wherein n is 2–6 and R_{10} and R_{11} together with the nitrogen atom to which they are attached from a piperidinyl group and subliming said frozen solution by heating the same under a vacuum to a temperature lower than the melting point of said frozen solution.

3,981,677

OXIDATIVE HAIR DYE COMPOSITIONS CONTAINING N-SUBSTITUTED o-PHENYLENEDIAMINES AND METHOD FOR THEIR USE

Alexander Halasz, Norwalk, Conn.; Frederick Brody, deceased, late of Greenwich, Conn., by Richard Newman, executor, New York, N.Y., assignors to Clairol Incorporated, New York, N.Y.

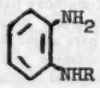
Filed Jan. 2, 1974, Ser. No. 430,334

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² A61K 7/13

U.S. Cl. 8—10.2 **26 Claims**

1. An oxidation hair dyeing composition comprising a water containing hair dye carrier and a tinctorially effective amount of an o-phenylenediamine of the formula:



wherein R is alkyl having 1 to 4 carbon atoms.

3,981,678

LYOPHILIZED DYES AND THE USE THEREOF TO COLOR KERATINIC FIBERS

Giuliana Ghilardi, Paris; Pierre Boré, Montfermeil, and Jean-Francois Grollier, Paris, all of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 120,353, March 2, 1971, abandoned. This application June 25, 1973, Ser. No. 372,934

Claims priority, application Luxemburg, Mar. 3, 1970, 60449; Oct. 19, 1970, 61890; Feb. 15, 1971, 62596; June 26, 1972, 65590

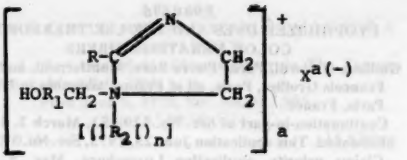
Int. Cl.² A61K 7/12

U.S. Cl. 8—11 **9 Claims**

1. A process for producing a lyophilized dyestuff for coloring keratinic fibers consisting essentially of reacting hydrogen peroxide with an oxidation base in an aqueous alkaline solution open to ambient atmosphere in the presence of an organic solvent for the resulting dyestuff, said organic solvent being selected from the group consisting of tert-butyl alcohol, dimethylsulfoxide, dioxane and benzyl alcohol and having a pH ranging from 8 to 13 at a temperature between about 15°–30°C for a period of about 5 minutes to 30 hours and lyophilizing said reaction mixture, the molar raito of said hydrogen peroxide to said oxidation base being between about 0.1:1 to 20:1, said oxidation base being selected from the group consisting of paratoluylene diamine, paraphenylene diamine, N,N-dimethylparaphenylene diamine, methyl paraphenylene diamine, chloroparaphenylene diamine, 2-methoxy-5-methyl paraphenylene diamine, 2,6-dimethyl-3-methoxy paraphenylene diamine, tetramethyl paraphenylene

diamine, 2-methoxy paraphenylene diamine, para aminophenol, 2,6-dimethyl para aminophenol, 2,4-diamino anisole, 2-methyl para aminophenol, 1-methoxy-2,5-dimethyl paraphenylene diamine, and the hydrochlorides thereof, wherein lyophilizing said reaction mixture comprises freezing said reaction mixture at a temperature of about −200° to −60°C and subliming said frozen mixture at a temperature of about −50°C to −30°C at a pressure of about 0.01 mm Hg to 0.1 mm Hg.

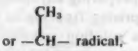
8. A process for producing a lyophilized dyestuff for coloring keratinic fibers consisting essentially of reacting hydrogen peroxide with an oxidation base in an aqueous alkaline solution open to ambient atmosphere in the presence of a coupler selected from the group consisting of metaphenylene diamine, 2,4-diamino anisole, 2,4-diamino toluene, metaaminophenol, 6-methyl-3-aminophenol, N-methyl metaaminophenol, 4-methoxy-3-aminophenol, resorcin, 2,6-xylenol, α-naphthol, 3-methoxy-4-aminophenol and the sulfate, hydrochloride and hydrobromide thereof, the molar ratio of said coupling agent to said oxidation base before oxidation being between 0:1 and 10:1 and in the presence of an organic solvent for the resulting dyestuff, said organic solvent being selected from the group consisting of tert-butyl alcohol, dimethyl sulfoxide, dioxane and benzyl alcohol and having a pH ranging from 8 to 13 at a temperature between about 15°–30°C for a period of about 5 minutes to 30 hours and lyophilizing said reaction mixture, the molar ratio of said hydrogen peroxide to said oxidation base being between about 0.1:1 to 20:1, said oxidation base being selected from the group consisting of paratoluylene diamine, paraphenylene diamine, N,N-dimethyl paraphenylene diamine, methyl paraphenylene diamine, chloroparaphenylene diamine, 2-methoxy-5-methyl paraphenylene diamine, 2,6-dimethyl-3-methoxy paraphenylene diamine, tetramethyl paraphenylene diamine, 2-methoxy paraphenylene diamine, para aminophenol, 2,6-dimethyl para aminophenol, 2,4-diamino anisole, 2-methyl para aminophenol, 1-methoxy-2,5-dimethyl paraphenylene diamine and the hydrochlorides thereof, wherein lyophilizing said reaction mixture comprises freezing said reaction mixture at a temperature of about −200° to −60°C and subliming said frozen mixture at a temperature of about −50° to −30°C at a pressure of about 0.01 to 0.1 mm Hg.



wherein:

R is a hydrocarbon radical having 15 to 17 carbon atoms,

R_1 is a



R_2 is hydrogen, an unsubstituted or hydroxy-substituted aliphatic hydrocarbon radical having 1 to 6 carbon atoms or a benzyl radical,

X equals a water-soluble anion, and

a is a number equal to the ionic valence of the anion, X.

3,981,679

METHOD FOR DYEING THE JUTE BACKING OF MULTILEVEL NYLON CARPET WITHOUT STAINING THE NYLON FACE FIBERS

Nick J. Christie, Mendham, and John Karnilaw, Parsippany, both of N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed May 21, 1975, Ser. No. 579,462
Int. Cl.² D06P *3/874*
U.S. Cl. 8—21 B **11 Claims**

1. In a process of dyeing with a cationic dye the backing of a jute-backed carpeting having multilevel nylon face fibers, the improvement which comprises; dyeing the jute backing in the presence of a quantity of an imidazoline compound preventing discernible staining of the face fibers, said compound having the general formula:

wherein:

R is a hydrocarbon radical having 15 to 17 carbon atoms,

R_1 is a

R_2 is hydrogen, an unsubstituted or hydroxy-substituted aliphatic hydrocarbon radical having 1 to 6 carbon atoms or a benzyl radical,

X equals a water-soluble anion, and

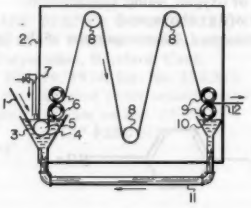
a is a number equal to the ionic valence of the anion, X.

3,981,680

PROCESS FOR CONTINUOUSLY FIXING VAT DYES ON A TEXTILE WEB

John Milford Fletcher, R.F.D. No. 3, Box 376, Opelika, Ala. 36801

Filed Jan. 17, 1975, Ser. No. 541,737
Int. Cl.² D06P *1/22*
U.S. Cl. 8—34 **3 Claims**



1. In the process of continuous vat dyeing of a textile web comprising passing said web through an essentially anaerobic steamer having a web entrance and a web exit and at or near said entrance, applying to said web, by means situate at or near said entrance, a vat dye and reductant liquor obtained either by applying to the web a preformed aqueous liquor comprising a vat dye and a reductant or by applying a reductant liquor to a web carrying vat dye in the oxidized form, and vat dye being reduced by said reductant liquor and fixed to the web during passage through the steamer, the improvement consisting in:

A. applying, by means situate at or near said web entrance a vat dye and reductant liquor or a reductant liquor in excess of that expressable by squeeze rolls;

B. expressing liquor from said web by means of squeeze rolls situate at or near said web exit;

C. collecting and applying expressed liquor to said web together with vat dye and reductant liquor or reductant liquor by said means situate at or near said web entrance.

3,981,681

DEPILATORY FORMULATION

Mario de la Guardia, Savannah, Ga., assignor to Carson Products Company, Savannah, Ga.

Filed Apr. 16, 1974, Ser. No. 461,352

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.[2] A61K 7/155

U.S. Cl. 8—161 13 Claims

1. A stable aqueous depilatory composition having a pH of about 11.5 to about 12.7 comprising, as the essential active ingredients,

a. one part of at least one alkali metal silicate, wherein the amount of said alkali metal silicate is about 0.1 to 1.0 weight percent, based on the total weight of said composition,

b. 5 to 200 parts of at least one alkaline earth metal acid salt, wherein the acid is selected from the group consisting of thioglycolic acid and thiolactic acid, and

c. 1 to 50 parts of thiourea, wherein the composition has a shelf stability under ambient conditions of at least three months.

3,981,682

CORROSION INHIBITING COMPOSITIONS AND PROCESS FOR INHIBITING CORROSION OF METALS

Benjamin F. Ward, and William G. Vardell, both of Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

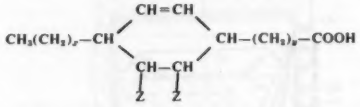
Division of Ser. No. 341,588, March 15, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 527,999

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.[2] C23F 9/02, 11/00, 11/10

U.S. Cl. 21—2.7 R 2 Claims

1. A process for rust inhibition of metallic surfaces contacted by petroleum hydrocarbons and aqueous media which comprises, contacting said metallic substances with from 1 to 200 parts per million of an additive of the group consisting of a dicarboxylic acid having the following structure:



wherein x and y are integers from 3 to 9, x and y together equal 12, and Z is a member of the group consisting of hydrogen and COOH with one Z of each moiety, the hydrogenated dicarboxylic acid of said structure, the bisalkanolamide derivatives of said dicarboxylic acid, the mono-alkanolamide derivatives of said dicarboxylic acid, and the mono-alkanolamide derivatives of a soap of said dicarboxylic acid.

3,981,683

TEMPERATURE RESPONSIVE STERILITY INDICATOR

Raymond P. Larsson, Denville, and Robert J. Witonsky, Princeton, both of N.J., assignors to Bio-Medical Sciences, Inc., Fairfield, N.J.

Filed Apr. 14, 1975, Ser. No. 568,149

Int. Cl.[2] G01N 31/22; G01K 11/06, 11/12

U.S. Cl. 23—253 TP 17 Claims

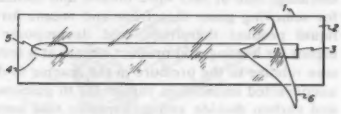
1. A sterility indicator device for use in a steam autoclave comprising:

a. a backing strip

b. an organic compound having a normal melting point which is greater than a predetermined control temperature said melting point being depressed below said control temperature by the absorption of water into the organic compound when said organic-compound is exposed to saturated water vapor at the control temperature, said control temperature being below the normal melting point of the organic compound, said compound being mounted on said backing strip.

c. a wicking means having one end of said wicking means in intimate contact with said compound, said wicking means extending away from said compound and being mounted on said backing strip; and

d. a water vapor transmission rate controlling cover strip overlayer covering said compound and wicking means



said cover strip being bonded to said backing strip and being permeable to water vapor and having a water permeability coefficient at the control temperature such that sufficient water vapor will permeate the cover strip to reduce the melting point of the organic compound from its normal melting point to the control temperature; said device being inoperative at the predetermined control temperature in the absence of saturated steam and displaying a visual response of the integrated time/temperature exposure of a system to moist heat.

3,981,684

APPARATUS FOR CONTROLLING UREA SYSTEM

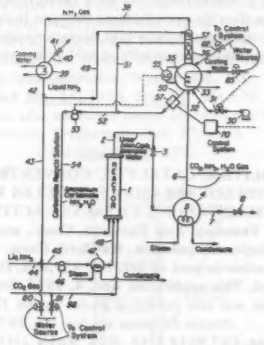
Ivo Mavrovic, 530 E. 72nd St., New York, N.Y. 10021

Division of Ser. No. 468,255, May 9, 1974, Pat. No. 3,940,440, which is a continuation of Ser. No. 88,272, Nov. 10, 1970, abandoned. This application Oct. 15, 1975, Ser. No. 622,531

The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.

Int. Cl.[2] B01J 1/00; G05D 11/00

U.S. Cl. 23—260 20 Claims



1. A system for the synthesis of urea with ammonium carbamate solution recycle, wherein fluid ammonia, fluid carbon dioxide and a solution comprising ammonium carbamate are reacted at elevated pressure and temperature to synthesize urea in a urea reactor, and wherein water balance is maintained in the system, comprising:

sources of fluid ammonia and fluid carbon dioxide;

a source of water:

a urea synthesis reactor having first inlet means coupled to said sources and second inlet means receiving said solution comprising ammonium carbamate, said reactor for

reacting said fluid ammonia, fluid carbon dioxide and said solution comprising ammonium carbamate at elevated pressure and temperature therein to produce a urea product stream containing urea, water, unconverted ammonium carbamate and ammonia, said reactor further including outlet means for discharging said urea product stream therefrom;

valve means coupled with said reactor outlet means to reduce the pressure of said urea product stream;

a decomposer equipped with inlet means coupled to the discharge side of said valve means, and including means for removing gases therefrom and means for removing liquid product therefrom, said decomposer including means for heating said product stream at a reduced pressure relative to the pressure in the reactor to decompose unconverted ammonium carbamate to gaseous ammonia and carbon dioxide and to vaporize said ammonia and expel the total mixture of gaseous ammonia and carbon dioxide together with some water vapor from the aqueous urea solution through said gas removing means;

a condenser having at least one inlet means and outlet means, the at least one condenser inlet means being coupled to said gas removing means of the decomposer, said condenser condensing gaseous ammonia and carbon dioxide and water vapor to a liquid phase containing ammonium carbamate, ammonia and water, the liquid phase being fed to the condenser outlet means;

conduit means coupling said outlet means of said condenser to said second inlet means of said reactor for charging recycled ammonium carbamate solution to said reactor;

a refractometer coupled between said condenser outlet means and said second inlet means of said reactor for sensing a refractive index value of said liquid phase recycled to said second inlet of said reactor, said refactive index value being a function of the weight ratio of carbon dioxide as carbamate to water in said liquid phase; and

regulating means including at least one valve means coupled to said water source and controlled by said refractometer for regulating the weight ratio of carbon dioxide to water in said liquid phase in said condenser by varying the flow rate of water to said condenser as a function of deviations of said sensed refractive index value from a reference value which corresponds to a reference weight ratio of carbon dioxide as carbamate to water in said liquid phase to substantially reduce said deviations and maintain said weight ratio substantially at said reference weight ratio.

3,981,685

MONOLITHIC CATALYTIC CONVERTER HAVING FLUIDIZED ABRASIVE PARTICLES BED FOR MAINTAINING CATALYST ACTIVITY

Francis J. Fennessy, East Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 427,872, Dec. 26, 1973, abandoned. This application Apr. 4, 1975, Ser. No. 565,180

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² B01J *8/18, 8/24;* **F01N** *3/15, 5/04*

U.S. Cl. 23—288 F **4 Claims**

1. A catalytic reactor for purifying exhaust gases including:

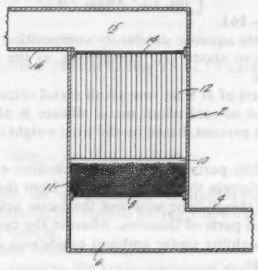
a vertically disposed chamber having a bed of abrasive particles in the bottom thereof;

a first porous screen for supporting the particles;

a catalytic structure above the particles and mounted in the chamber, said structure having vertical passages defining substantially vertical catalytic surfaces, each of said vertical passages extending from the bottom of said structure to the top thereof and providing for the unimpeded flow of gases therethrough, the abrasive particles being substantially smaller than the passages for movement of the particles vertically in both directions in the passages;

a second porous screen at the top of said catalytic structure for preventing loss of said particles from said reactor;

the bottom end of the catalytic structure being spaced above the top surface of the bed of particles to leave a clearance space therebetween; and



said reactor having an inlet located below said first porous screen and an outlet at the top of the reactor above the top of said second porous screen for passing exhaust gases upwardly through the bed and through the catalytic structure for purifying said exhaust gas and fluidizing said bed such that the particles abrade the catalytic surfaces.

3,981,686

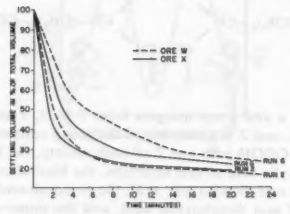
CLARIFIER PROCESS FOR PRODUCING SODIUM CARBONATE

Walter Lobunez, Princeton, N.J.; Nam Kyun Kim, Green River, Wyo., and Eric Rau, Trenton, N.J., assignors to Intermountain Research and Development Corporation, Green River, Wyo.

Filed Oct. 24, 1974, Ser. No. 517,472

Int. Cl.² C01B *7/00, 7/14;* **B01D** *9/02;* **C01B** *7/24*

U.S. Cl. 23—302 T **7 Claims**



1. A method for clarifying a carbonate process solution used in the preparation of crystals selected from the group consisting of sodium bicarbonate, sodium sesquicarbonate, anhydrous sodium carbonate and sodium carbonate monohydrate, which comprises:

forming a carbonate process solution containing suspended insolubles and a material selected from the group consisting of sodium carbonate and sodium bicarbonate;

dispersing in the carbonate process solution about 1 to about 20 ppm of a cationic flocculating agent comprising a substituted guar gum containing one quaternary ammonium group per 2 to 12 monosaccharide units;

agglomerating the suspended insolubles by forming agglomerated particles of increased size and density;

settling and removing the agglomerated particles from the carbonate process solution; and

crystallizing the clarified carbonate process solution to produce crystals selected from the group consisting of

sodium bicarbonate, sodium sesquicarbonate, anhydrous sodium carbonate and sodium carbonate monohydrate.

3,981,687

METHOD OF TREATING QUARTZ CRYSTAL RESONATORS

John R. Vig, Colts Neck, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 8, 1975, Ser. No. 575,854
Int. Cl.² H01L *41/22*
U.S. Cl. 29—25.35 **14 Claims**

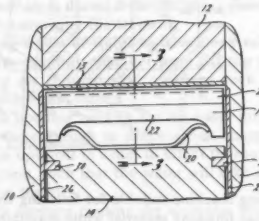
1. A method of reducing the aging and thermal hysteresis of quartz crystal resonators, said method including the steps of:
   a. hermetically sealing the quartz crystal resonator in a housing including a material transparent to ultraviolet radiation capable of polymerizing contaminants, and
   b. irradiating the contaminants within said resonator housing with ultraviolet radiation to polymerize said contaminants.

3,981,688

COATING FOR ROTARY ENGINE ROTOR HOUSINGS AND METHOD OF MAKING

Yeshwant P. Telang, Grosse Ile, and James C. Uy, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 376,862, July 5, 1973, Pat. No. 3,890,069. This application June 7, 1974, Ser. No. 477,230
Int. Cl.² F01C *21/00;* **F04C** *15/00*
U.S. Cl. 29—156.4 WL **6 Claims**



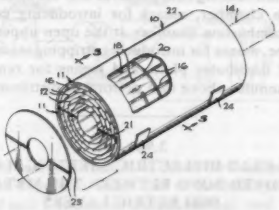
1. A method of producing a wear-resistant rotor housing for a rotary internal combustion engine, the rotor housing comprising part of the means defining a combustion chamber arranged for a planetary movement of a rotor therein, the method comprising:
   a. preparing a cast rotor housing for defining a supporting epitrochoid shaped end wall, said casting being milled to define a reference and being prepared from an aluminum alloy composition comprising silicon 16–18%, iron 0.5 maximum, magnesium 0.45–0.65, titanium 0.25 maximum and the remainder aluminum,
   b. removing a uniform layer of said casting along said end wall to a depth of 0.125 inch,
   c. thermally spraying a mixture of martensitic stainless steel powder and a nickel-based alloy powder uniformly across said supporting end wall within the thickness range of 0.015–.030 inches,
   d. immersing said coated casting in a medium of oil,
   e. removing the outer surface of said coating to a depth commensurate with said reference.

3,981,689

INSULATOR

Robert B. Trelease, Torrance, Calif., assignor to Hitco, Irvine, Calif.

Filed Oct. 15, 1974, Ser. No. 514,386
Int. Cl.² B32B *3/00;* **F16L** *59/14;* **F28F** *13/00*
U.S. Cl. 29—183 **21 Claims**



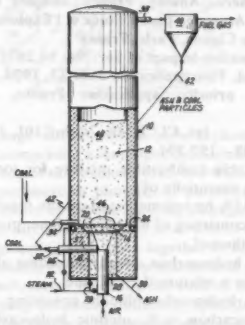
1. An insulator comprising a plurality of generally planar, sheet-like elements disposed in nominally parallel relationship with each other so as to define intersheet gaps between adjacent pairs of the sheet-like elements, each of the sheet-like elements having a plurality of corrugations therein which extend outwardly from the plane of the sheet-like element in at least one direction and through part but not all of the intersheet gap formed by the sheet-like element and an ajacent sheet-like element, the intersheet gaps having a nominal size between the adjacent sheet-like elements of substantially less than one-half inch, each of the corrugations being separated from adjacent corrugations by relatively flat areas of the sheet-like elements substantially larger in area than the area of the corrugations, and means for holding the sheet-like elements apart from one another to maintain the intersheet gaps and to prevent contact between adjacent ones of the sheet-like elements.

3,981,690

AGGLOMERATING COMBUSTOR-GASIFIER METHOD AND APPARATUS FOR COAL GASIFICATION

Joseph L. P. Chen, Murrysville, and David H. Archer, Pittsburgh, both of Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 15, 1975, Ser. No. 541,376
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² C10J *3/20*
U.S. Cl. 48—73 **11 Claims**



1. Apparatus for gasification of coal particles comprising a vertically disposed refractory lined, pressure vessel, outlet means in the upper portion thereof for removing gases, an

upper section of said vessel defining a gasification chamber and a lower section of said vessel being of reduced diameter and forming a combustion chamber, a central tube for introduction of air extending into said pressure vessel through the bottom thereof and having an open upper end terminating at said combustion chamber, said tube and the lower portion of the inner refractory wall of said vessel forming an annulus, a perforated distributor plate extending across said annulus, means for introducing coal particles into the lower part of said gasification chamber, means for introducing coal particles into said combustion chamber at the open upper end of said central tube, means for introducing stripping steam below said perforated distributor plate, and means for removal of ash from the annulus above said perforated distributor plate.

3,981,691

METAL-CLAD DIELECTRIC SHEETING HAVING AN IMPROVED BOND BETWEEN THE METAL AND DIELECTRIC LAYERS

Edward A. Cuneo, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 1, 1974, Ser. No. 484,952

Int. Cl.² B32B *15/08*, *15/20*; **C23F** *1/02*; **H05K** *1/00*

U.S. Cl. 29—195 **13 Claims**

1. Multilayered sheeting useful as a component of flexible electric circuitry, comprising a layer of electrically conductive metal, a thin black-chromium layer on at least one side of the layer of conductive metal, and a layer of electrically insulating polymeric material bonded to said black-chromium layer, whereby after etching of the layer conductive metal to provide narrow-width conductors, the conductors will not be delaminated from the layer of electrically insulating polymeric material by exposure of the sheeting for 5 minutes in a 10-normal hydrochloric acid bath at 25°C.

8. Multilayered sheeting useful as a component of electric circuitry comprising a layer of copper-based electrically conductive metal, a thin black-chromium layer on at least one side of the layer of conductive metal, and a layer of polyimide electrically insulating polymeric material bonded to said black-chromium layer, whereby after etching of the layer of conductive metal to provide narrow-width conductors, the conductors will not be delaminated from the polyimide layer by exposure for 5 minutes in a 10-normal hydrochloric acid bath at 25°C.

9. Multilayered sheeting of claim 8 in which the layer of conductive metal is configured as an electrical circuit.

3,981,692

COMBUSTIBLE MIXTURE FOR TORCHES AND BURNERS

Georges Seris, Antony, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Continuation-in-part of Ser. No. 94,207, Nov. 20, 1970, abandoned. This application Feb. 27, 1974, Ser. No. 446,326

Claims priority, application France, Nov. 29, 1969, 69.40730

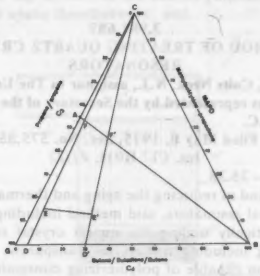
Int. Cl.² B23K *7/00*; **C10L** *3/00*

U.S. Cl. 48—197 FM **12 Claims**

1. A stable combustible mixture for torches and burners consisting essentially of

1. 40–45% by volume based on the total combustible mixture consisting of methylacetylene, propadiene or a mixture thereof,
2. a C_3 hydrocarbon diluent consisting of propane, propylene or a mixture thereof; and
3. a C_4 hydrocarbon diluent consisting of a C_4 paraffinic hydrocarbon, a C_4 olefinic hydrocarbon or a mixture thereof;

the volume ratio of said methylacetylene, propadiene or mixture thereof to said C_3 hydrocarbon diluent being no greater than 55:45, and the volume ratio of said C_3 hydrocarbon diluent to said C_4 hydrocarbon diluent being from 70:30 to 95:5;



the endothermic heat of formation of said combustible mixture being at least 10KCal per molar volume.

3,981,693

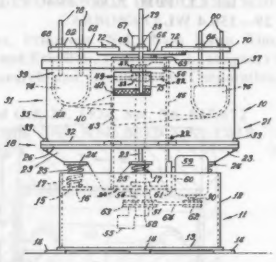
FINISHING APPARATUS

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Kalamazoo, Mich.

Filed Nov. 12, 1973, Ser. No. 414,656

Int. Cl.² B24B *31/06*

U.S. Cl. 51—163.2 **30 Claims**



1. A finishing machine suitable for finishing the surfaces of parts with loose finishing material while maintaining a part or parts isolated from other parts and to prevent damage to parts as a result of collision therebetween, said finishing machine comprising:

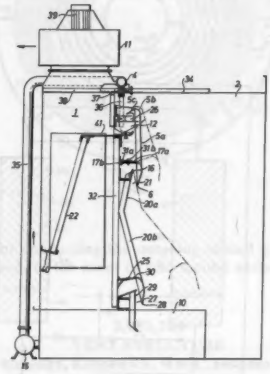
a. a resiliently supported finishing chamber,

2. means for imparting vibratory movement to said finishing chamber to cause the parts contained therein to be finished by interaction with said finishing material and to move along said chamber,
3. part-isolating means defining at least two compartments in said finishing chamber arranged to contain a part or parts therein and to maintain said part or parts isolated from other parts in said finishing chamber,
4. wherein said part-isolating means comprises partitions arranged for movement along said finishing chamber and adapted to be carried along by the contents of the finishing chamber,
5. wherein said part-isolating means also comprises support means mounted for movement with respect to said finishing chamber, said partitions being supported by said support means, said support means being arranged to guide said partitions along said finishing chamber with said contents of the finishing chamber,
6. wherein said finishing chamber is annular, and
7. wherein said support means comprises a turntable.

3,981,694
METHOD AND MEANS FOR AIR PURIFICATION DURING SPRAY-PAINTING

Lars Evert Hultgren, Huddinge, and Olof Engwall, Lidingo, both of Sweden, assignors to Thermospray AG, Zug, Switzerland

Filed Sept. 4, 1974, Ser. No. 503,076
Claims priority, application Sweden, Sept. 10, 1973, 7312306
Int. Cl.² B01D 47/00
U.S. Cl. 55—90 10 Claims



1. A method of cleaning air from a spraying-painting chamber having a plurality of walls spaced apart to define therebetween at least one upper opening and one lower opening, through which air is drawn from the spray-painting chamber, the method comprising the steps of:

a. providing a film of water to flow along said walls inside said spray-painting chamber from the top thereof;

b. drawing air through said openings such that water is drawn therewith;

c. for each opening causing the air-water mixture which is passed therethrough to make a first sharp alteration in direction upwards in order to effect thorough mixing and atomization, such that the water will take up paint particles from the air;

d. for each opening causing the air-water mixture which is passed therethrough to make a second alteration in direction downwardly and into a cleaning chamber such that the speed of the air-water mixture is reduced and the water drawn in through the openings together with paint particles taken up are separated and deposited; and

e. supplying water in a sufficient amount so as to provide said film such that at least at said upper opening only a portion of the water flowing down across the opening is drawn in therethrough, while the rest of the water flowing down across the opening continues to flow down along a wall of said plurality of walls below said upper opening.

3,981,695
ELECTRONIC DUST SEPARATOR SYSTEM

Heinrich Fuchs, Haus 88, 8601 Steinfeld, Germany

Filed Nov. 2, 1973, Ser. No. 412,185
Claims priority, application Germany, Nov. 2, 1972, 2253601; Aug. 11, 1973, 2340716
Int. Cl.² B03C 3/00
U.S. Cl. 55—138 26 Claims

1. A device for the electronic collection of dust comprising:

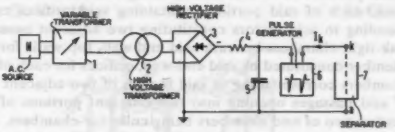
an electrostatic separator including an anode and a cathode,

a high voltage transformer including a primary winding and a secondary winding,

means for supplying an input voltage to said primary winding,

a pulse generator connected in circuit with said transformer for supplying a pulse to said electrostatic separator,

the output voltage of said transformer being close to and below the spark over limit of said electrostatic separator, said pulse generator voltage being superimposed on the



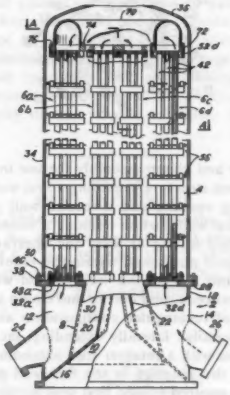
output of said transformer to cause the voltage to exceed the spark over limit within one of the half cycles of each cycle of said transformer output voltage, and

a serial electrical path including a capacitor and a diode connected across said secondary winding of said transformer and connected to and supplying voltage across said electrostatic separator anode and cathode.

3,981,696
MULTIPASSAGE DIFFUSER

André Lalis, Le Plessis Robinson; René Rouviere, Orange, and Gilbert Simon, Sevres, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 7, 1974, Ser. No. 467,743
Claims priority, application France, May 18, 1973, 73.18166
Int. Cl.² B01D 53/22
U.S. Cl. 55—158 7 Claims



1. A multi-passage diffuser for isotopic separation of air isotopic mixture comprising a leak-tight cylindrical enclosure cover closing the top of said enclosure, an end-wall closing the bottom of said enclosure, a plurality of parallel rectilinear tubes in said enclosure of porous material through which the isotopic mixture is circulated, parallel to an axis of said enclosure, means for grouping said tubes together in sectors each sector having a plurality of tubes, top and bottom perforated tube plates for each sector receiving the ends of the tubes of the sector, clamping members uniformly spaced along the tubes of each sector rigidly coupling the tubes of each sector, said sectors being disposed at uniform intervals around the interior periphery of said enclosure, a floating annular header in said enclosure, said top perforated tube plates being rigidly fixed to said annular header, said header being a half-torus, an

orifice in said header opposite each of said top tube plates establishing communication between said header and said tubes of the corresponding one of said sectors, said bottom tube plates being rigidly fixed to said end-wall of said enclosure, orifices in said end-wall opposite each of said bottom tube plates, passages constituted by a plurality of juxtaposed sectors in which the mixture circulates in the same direction, radial portions in said header dividing said header into portions, each of said portions containing said orifices corresponding to said sectors constituting two adjacent passages, leak-tight chambers beneath said end-wall, top walls for said chamber constituted by said end-wall, orifices for each of said chambers corresponding to said sectors of two adjacent ones of said passages opening into two different portions of said header, two of said chambers being collector-chambers, each of said collector-chambers communicating with said sectors of one of the two remaining passages, a nozzle for each of said collector-chambers for introducing the isotopic mixture and for discharging the fraction of the undiffused mixture, a central orifice for said end-wall opening into the interior of said enclosure and a shaft connected to said central orifice for discharging the diffused fraction of the isotopic mixture.

3,981,697

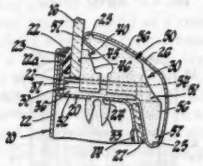
CARRIER AND CLAMP ASSEMBLY FOR A VEHICLE WINDOW

George E. Buckthorpe, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 22, 1975, Ser. No. 615,764

Int. Cl.² E04B *1/62*; **E04F** *15/14*

U.S. Cl. 52—400 **5 Claims**



1. A carrier and clamp assembly for use in a vehicle body having a support structure providing a first wall portion defining a receiving opening and a second wall portion at right angle to the first wall portion defining a window opening, the first wall portion having at least one aperture therethrough and a glass panel positioned within the receiving opening in abutment against the second wall portion with a seal sandwiched therebetween, said carrier and clamp assembly including a carrier of rectangular configuration and having a top surface with parallel, laterally extending, inclined serrations thereon, a base with a retainer stud extending therefrom for insertion into the aperture in the first wall portion whereby said carrier is secured to said first wall portion at right angle to the second wall portion in position to support an edge of the glass panel on the top surface of said carrier, said carrier further having longitudinal sides, each said side having a groove therein extending the length of said side and, a clamp slidably positioned on said carrier, said clamp including a body portion having a longitudinal channel therethrough and extending from one surface thereof whereby said clamp is slidably received on said carrier, said channel defining spaced apart side walls with inwardly extending flanges of a configuration complementary to said grooves to slidably interlock therewith, said side walls being interconnected by a wall having parallel laterally extending serrations thereon to interlock with said serrations on said carrier whereby said clamp is movable in only one direction relative to said carrier and is locked to said carrier by said serrations against movement in the opposite direction.

3,981,698

PROCESS FOR THE REMOVAL OF CARBON DIOXIDE FROM GASES

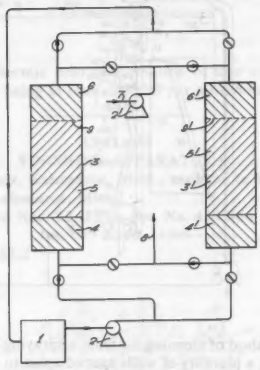
Colin James Leppard, Emsworth, England, assignor to CJB Development Limited, London, England

Continuation-in-part of Ser. No. 388,352, Aug. 15, 1973, Pat. No. 3,893,827. This application Feb. 18, 1975, Ser. No. 550,777

Claims priority, application United Kingdom, Feb. 22, 1974, 8192/74

Int. Cl.² B01D *53/04*

U.S. Cl. 55—31 **9 Claims**



1. A process for the removal of carbon dioxide from a wet stream which process comprises passing the gas stream through an integrated absorption bed which comprises a first portion which is an absorbent for water whereby water is removed from the gas stream, a second portion which is an absorbent for carbon dioxide whereby carbon dioxide is removed from the gas stream and a third portion which is an absorbent for water which is saturated with water whereby water is reintroduced into the gas stream, the first portion of the integrated absorption bed being maintained at a higher pressure than that of the desorbing third portion of the bed by incorporating a pressure plate between the second portion and third portion of the integrated absorption bed.

3,981,699

PURIFIER

Victor D. Molitor, 90 Corona St., Denver, Colo. 80218

Filed Oct. 25, 1974, Ser. No. 517,851

Int. Cl.² B01D *53/04*

U.S. Cl. 55—208 **7 Claims**

1. A purifier comprising:

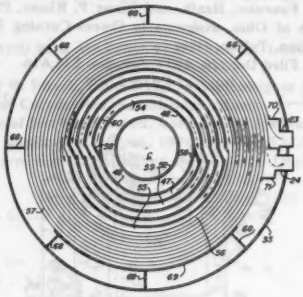
a first series of generally concentric spiral passages interspaced and in heat exchange relationship with a second series of generally concentric spiral passages;

a container for gettering material disposed centrally of said first and second series of passages;

each said series of spiral passages including spiral plates and end walls between said plates forming the opposite ends of the respective passages;

a heater for heating said gettering material to a predetermined temperature and for heating the gases passing through said container;

means for conducting untreated gases to the outer of said first series of passages; and

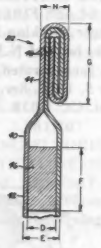


means for conducting the outgoing heated gases from said container to the inner of said second series of passages.

3,981,700
VENT STRUCTURE

Joseph C. McGuire, Kennewick, Wash., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 296,680, Oct. 11, 1972, Pat. No. 3,876,403. This application May 3, 1974, Ser. No. 466,522
The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.
Int. Cl.² B01D *19/00*
U.S. Cl. 55—385 C **6 Claims**



1. A vent structure comprising:

a tubing of predetermined length and size, said tubing including an undeformed normally lower portion and a formed normally upper portion, and said upper tubing portion being flattened and folded against itself;

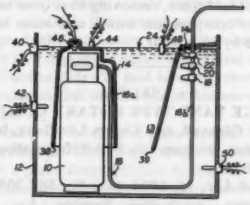
means provided in said upper tubing portion for separating its opposing proximate faces to prevent sintering and similar closures thereof; and

a particulate filter installed in said lower tubing portion for filtering out particulate matter while allowing free passage of gas therethrough whereby proper venting of gas can be maintained through said vent structure to produce a reliable, particulate filtered, long term operation vent structure.

3,981,701
METHOD AND APPARATUS FOR CONTROLLING A VOLATILE SUBSTANCE

Harold Willids Andersen, and Charles H. Harrison, both of Oyster Bay, N.Y., assignors to H.W. Andersen Products Inc., Oyster Bay, N.Y.

Filed Aug. 10, 1973, Ser. No. 387,461
Int. Cl.² F17C *13/02*
U.S. Cl. 62—49 **11 Claims**

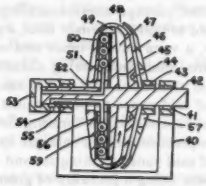


1. The method of determining impairment of the containment and isolation integrity of a volatile substance contained and isolated under pressure within a closed storage tank comprising the steps of containing and isolating said volatile substance under pressure within a closed impervious storage tank, providing a man-made manufactured vessel, maintaining an immersion fluid within said vessel at a pressure lower than the pressure of the volatile substance in said closed storage tank, said immersion fluid being capable of absorbing said volatile substance, immersing said storage tank within said immersion fluid while maintaining the containment and isolation integrity between the volatile substance in said storage tank and the immersion fluid in said vessel, and sensing changes in said immersion fluid caused by absorption of said volatile substance by said immersion fluid upon accidental or other unintentional failure of containment and isolation integrity between said volatile substance in said storage tank and the immersion fluid in said vessel, and utilizing said sensed changes to determine impairment of the containment and isolation integrity of said volatile substance in said storage vessel.

3,981,702
HEAT EXCHANGER

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Division of Ser. No. 423,560, Dec. 10, 1973, abandoned, which is a division of Ser. No. 357,588, May 7, 1973, abandoned.
This application Dec. 2, 1974, Ser. No. 528,878
Int. Cl.² F25B *3/00*
U.S. Cl. 62—87 **1 Claim**



1. A method of transferring heat from a lower temperature to a higher temperature comprising compressing a first fluid by a centrifugal force within an outwardly extending first passage of a rotating rotor with accompanying temperature increase; expanding said compressible first fluid inwardly in a second passage that is connected at its outward end with said outwardly extending passage outer end by a first passage

means, connecting said second passage inward end with a discharge means a second radial distance away from the center of rotation of said rotor, connecting said first passage inward end with an entry means with said entry means furthest radial distance from the center of rotation of said rotor being less than said second radial distance to provide a pressure differential for said first fluid within said rotor, said discharge means being a set of nozzles adapted of passing said first fluid and being oriented to discharge said first fluid away from the direction of rotation to generate torque on said rotor to assist in the rotation of said rotor, removing heat from said first fluid during and after compression within said rotor in a heat exchanger carried by said rotor.

3,981,703

MULTISTAGE VANE TYPE ROTARY COMPRESSOR

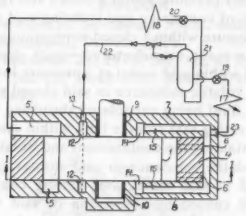
Rune Valdemar Glanvall, and Anders Lundberg, both of Norrkoping, Sweden, assignors to Stal-Refrigeration AB, Norrkoping, Sweden

Filed Apr. 15, 1975, Ser. No. 568,209

Claims priority, application Sweden, Apr. 23, 1974, 7405408

Int. Cl.[2] F25B 1/10; F04B 23/10

U.S. Cl. 62—509 1 Claim



1. A refrigeration circuit comprising a condensor having an inlet for compressed gas and an outlet, an intermediate pressure receptacle having an inlet and also having a gas outlet and a liquid outlet, a first expansion valve through which said condensor outlet is connected to said receptacle inlet, a second expansion valve connected to said liquid outlet of the receptacle, a low pressure duct leading from said second valve, an intermediate pressure duct leading from said gas outlet of the receptacle, and a compressor of the rotary vane type including a stator having a chamber of curved non-circular cross-section, defined by an inner surface and end plates, a rotor having a circular cross-section rotatably mounted within said chamber, the outer surface of said rotor, said end plates, and said inner surface defining a gas space, there being at least one inlet passage communicating with said gas space and to which said low pressure duct leads, there also being at least one outlet passage communicating with said gas space and connected to said condensor inlet, a plurality of vane slots in said rotor, a vane having inner and outer ends in each of said vane slots, said vanes being slidable inwardly and outwardly in said slots upon rotation of said rotor to permit the outer ends of said vanes to bear against the inner surface of said stator, successive vanes forming first working chambers of a first compression unit in said gas space and the outward movement of said vanes forming second working chambers in said slots, there being a plurality of grooves in at least one of said end plates, a first one of said grooves connecting with the second working chambers during at least one part of the outward movement of said vanes, and a second one of said grooves connecting with the second working chambers during at least one part of the inward movement of said vanes, gas inlet means connecting said intermediate pressure duct to said first groove, and gas outlet means connecting said second groove to said outlet passage from the gas space, whereby said second working chambers provide a secondary compression unit for compressing intermediate pressure gas from said receptacle.

3,981,704

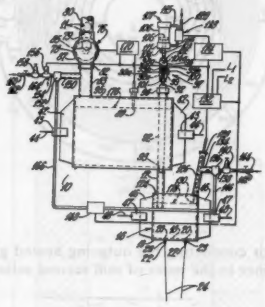
METHOD AND APPARATUS FOR PROCESSING GLASS

Wilfred A. Fournier, Heath, and Elmer P. Rieser, Pickerington, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 20, 1974, Ser. No. 534,616

Int. Cl.[2] C03B 37/02

U.S. Cl. 65—2 25 Claims



1. The method of processing glass comprising establishing a supply of molten glass in a chamber, transferring molten glass from the supply into a stream feeder, establishing gas pressure on the molten glass in the stream feeder, flowing streams of glass from the feeder under the influence of the pressure on the molten glass in the feeder, attenuating the streams of glass to fibers, and establishing gas pressure on the molten glass in the chamber to effect transfer of molten glass from the chamber into the stream feeder.

3,981,705

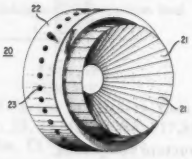
METHOD OF MAKING OPTICAL WAVEGUIDES FROM GLASS FIBERS

Raymond Edward Jaeger, Basking Ridge, and Thomas John Miller, Green Brook, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 5, 1975, Ser. No. 574,437

Int. Cl.[2] C03B 37/02

U.S. Cl. 65—2 11 Claims



1. A process for fabricating glass fiber in which the glass fiber is drawn from a glass preform which has been softened by heating with laser radiation in the frequency range where the glass is absorbent, comprising the steps of

A. directing the laser radiation onto a conical reflector with a hole in the center so as to reflect the laser radiation toward the glass preform, said conical reflector having at least 3 facets the number of facets and radii of curvature of the facets on the reflector being arranged to effect a uniform temperature distribution in the zone where the

glass is being necked down such that the focus of the laser beam does not concentrate at the center of the preform;

B. feeding the glass preform through the hole in the center of the conical reflector; and

C. pulling the glass fiber from the softened glass preform approximately along the axis of the glass preform.

3,981,706
METHOD FOR MAKING FLEXIBLE COLORED FIBER OPTIC DEVICE

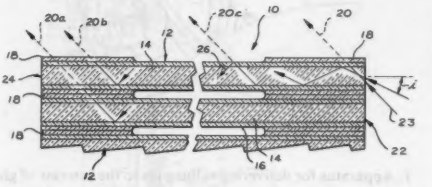
Richard R. Strack, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 354,600, April 26, 1973, abandoned. This application Dec. 16, 1974, Ser. No. 532,969

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C03C *25/02, 23/20, 15/00*

U.S. Cl. 65—3 A **5 Claims**



1. The method of forming a flexible fiber optic image-transmitting conduit comprising the steps of:

preparing a composition of leachable glass containing a light-absorbing colorant;

overcladding each of a multiplicity of long and thin glass clad glass optical fibers with said colored leachable glass, said overcladding in each case of each fiber comprising a second fiber cladding;

arranging said overclad optical fibers in intimately juxtaposed relationships with each other;

heating and fusing said overcladdings together as a matrix between said optical fibers;

leaching said matrix away from said optical fibers throughout a substantial portion of their lengths intermediately of corresponding opposite ends thereof while leaving an appreciable amount of said matrix adjacent each of said opposite ends of said fibers as fiber interconnecting and stray light-absorbing means.

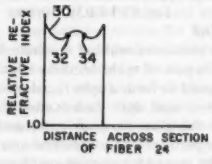
3,981,707
METHOD OF MAKING FLUORINE OUT-DIFFUSED OPTICAL DEVICE

Roger J. Araujo, Corning; Nicholas F. Borrelli, Elmira; John D. Crow, Mohegan Lake, and Thomas P. Seward, III, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 23, 1975, Ser. No. 570,713

Int. Cl.² C03C *25/02, 15/00;* **G02B** *21/34, 5/14*

U.S. Cl. 65—3 A **6 Claims**



1. A method of forming a planar optical waveguide comprising the steps of

providing a flat substrate of transparent silicate glass containing an amount of fluorine effective to decrease the refractive index thereof to a value below that of the silicate glass alone,

polishing a surface of said substrate to form an optical quality surface, and

heating said substrate to a temperature below the softening point temperature but greater than the annealing point temperature of said silicate glass, said temperature being sufficiently high to effect an out-diffusion of fluorine from said surface to form at said surface a layer of reduced fluorine content, the concentration of fluorine in said layer gradually increasing from a minimum value at said surface to a maximum value within said substrate so that the refractive index of said layer decreases from a maximum value at said surface to a minimum value within said substrate.

4. A method of forming a glass optical waveguide fiber having a refractive index distribution throughout its length such that in a plane perpendicular to the fiber optical axis the refractive index progressively decreases from a higher value at the optical axis of the fiber to a lower value at some finite fiber radius, said method comprising

providing a hollow tube of transparent silicate glass containing an amount of fluorine effective to decrease the refractive index thereof to a value below that of the silicate glass alone,

heating said tube to a temperature below the softening point temperature but greater than the annealing point temperature of said silicate glass, said temperature being sufficiently high to effect an out-diffusion of fluorine from at least the inner surface thereof to create at said inner surface a layer of reduced fluorine content, the concentration of fluorine in said layer gradually increasing from a minimum value at said inner surface to a maximum value within said tube, said fluorine out-diffusion process causing the refractive index of said tube to gradually decrease from a high value at the inner surface of said tube to a lower value within said tube,

subjecting said tube to a temperature sufficiently high to permit said tube to be drawn into a fiber, and

drawing said tube to collapse the hole in the center thereof and to reduce the cross-sectional area thereof and thereby form a glass optical fiber having a refractive index distribution throughout its length which progressively decreases from a high value at the optical axis of said fiber to a minimum value at some radius within said fiber.

3,981,708
SYSTEM FOR PRODUCING BLANKETS AND WEBS OF MINERAL FIBERS

Romain Eugene Loeffler, Littleton, and Forrest Theodore Rollins, Englewood, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Jan. 15, 1975, Ser. No. 541,358

Int. Cl.² C03B *37/00*

U.S. Cl. 65—4 R **20 Claims**

1. In a production line for the production of a thick mineral blanket comprised of a plurality of superposed mineral fiber mats comprising:

a. a plurality of mat forming modules arranged in an in-line orientation, along the production line each of said modules comprising:

i. a level having fiberizing means thereon,

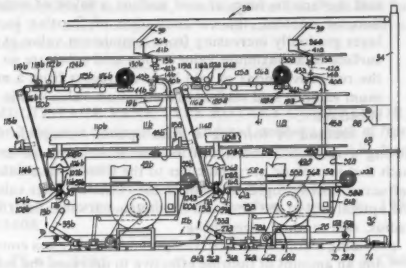
ii. a mat forming chamber,

iii. a mat delivery station,

iv. a foraminous fiber collecting conveyor located in said forming chamber to collect fiber in mat form and to convey said mat from said forming chamber to said mat delivery station,

v. a section box in communication with said forming chamber through said fiber collecting conveyor,

b. a transfer conveyor means located below said fiberizing level and arranged to travel adjacent to the plurality of said mat delivery stations spaced along said in-line orientation for receiving mats sequentially from the individual delivery station spaced along said transfer conveyor means to form a thick blanket of superposed mats, the improvement comprising: at least one of said modules comprising,



c. means located adjacent the downstream end of said collecting conveyor for removing said mat from said collecting conveyor,

d. means for elevating said mat to the vicinity of the fiberizing level,

e. means for cutting said mat into desired lengths, and

f. means for accumulating said cut lengths, whereby a mat from at least one module is individually elevated to the vicinity of the fiberizing level and accumulated while the mats from the remaining modules are directed onto said transfer conveyor means to form a different product.

3,981,709

EDGE PROCESSING OF CHEMICALLY TOUGHENED LENSES

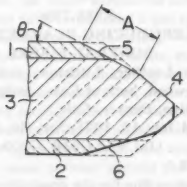
Fumio Kondo, Zushi; Masayuki Kondo, Tokyo; Tsuneyoshi Itoh, Tokyo, and Koji Sato, Tokyo, all of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1975, Ser. No. 565,457

Claims priority, application Japan, Apr. 10, 1974, 49-41233

Int. Cl.² C03C *15/00, 19/00;* **B24B** *7/00, 1/00*

U.S. Cl. 65—30 E **5 Claims**



1. A process for the production of toughened lenses, comprising the steps of chamfering peripheral portion of a lens which has been subjected to chemical tempering treatment, and edge grinding thereafter with the angle of chamfering to the tangential line on the optical surface of the lens at the edge thereof being less than 45°; said chemical tempering treatment imparting toughness properties to said lens, said toughness properties remaining substantially after said edge grinding, said chamfering removing distortions appearing at the lens periphery when carrying out said edge grinding.

3,981,710

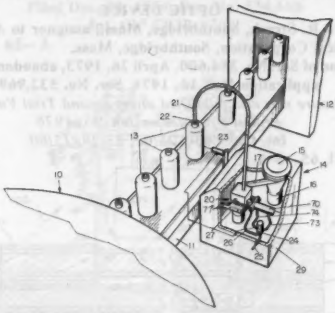
APPARATUS FOR SURFACE TREATING GLASS CONTAINERS

John R. Johnson, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 24, 1975, Ser. No. 571,149

Int. Cl.² C03B *25/04*

U.S. Cl. 65—158 **7 Claims**



1. Apparatus for delivering sulfur pills to the interior of glass containers moving on a conveyor, comprising in combination:

a pill feeder mounted alongside said conveyor;

a magazine extending downwardly from said pill feeder for receiving and storing pills from said feeder;

a pair of pocketed wheels mounted for rotation in opposite directions with the peripheral areas thereof in overlapping relationship with a pocket in each wheel in vertical alignment at the area of overlap, said pair of pocketed wheels forming a gating device positioned below said magazine;

means connecting said magazine to said gating device to supply pills to said pockets in said wheels;

a dispensing tube connected to said gating device and extending from said gating device to a position overlying said conveyor;

means connected to said gating device for operating said gating device to bring a predetermined number of pills into registry with the inlet of said dispensing tube; and

a source of fluid under pressure connected to said gating means at the inlet to said tube for propelling pills through said tube.

3,981,711

LUBRICATING SWABBING MEANS FOR GLASS CONTAINER MACHINE

Gösta Björkström, Limmared, Sweden, assignor to Aktiebolaget Platmanufaktur, Malmo, Sweden

Continuation-in-part of Ser. No. 487,315, July 10, 1974, abandoned, which is a continuation of Ser. No. 299,359, Oct. 20, 1972, abandoned. This application Feb. 18, 1975, Ser. No. 550,294

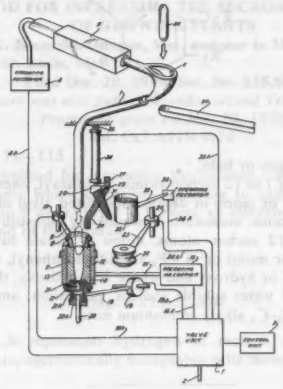
Claims priority, application Sweden, Feb. 8, 1972, 1504/72

Int. Cl.² C03B *39/00*

U.S. Cl. 65—165 **5 Claims**

1. In a glass container making machine having a source of glass parisons, a pair of mold sections which are controllably opened and closed to form a split faced mold, a feeding guide positioned above said split faced mold having a first end through which the glass parisons enter and a second end by which the glass parisons exit to descend upon the mouth of the split faced mold, means for moving said feeding guide between a first position above and laterally removed from said split faced mold with said second end spaced therefrom and a second position with said second end in close proximity to said mouth of said split faced mold, said first position defining the

position of said feeding guide after the glass parisons have been fed to said mouth and said second position defining the position of said feeding guide when feeding the glass parison to said mouth, a conveying device fixedly mounted above said mouth of said split faced mold having a first end for receiving the glass parisons and a second end spaced downwardly from said first end and communicating with said first end of said feeding guide to direct the glass parisons thereto, catcher means mounted for reciprocable movement above said first end of said conveying device, said catching means having a first enlarged end for receiving therein the supply of glass parisons and a second end spaced below said first end for the exit of the glass parisons therefrom, means for reciprocating said catcher means between a first position with said second end of said catcher means directly above said first end of said



conveying device and a second position with said second end spaced laterally from said first end of said conveying device so that the glass parisons being fed will be diverted from said conveying device, a neck mold mounted for reciprocating movement below said split faced mold, means for reciprocating said neck mold between a first position at the bottom of said split faced and a second position remote from said first position for subsequent treatment of the formed glass parisons, a nozzle for the spraying of compressed air, means for reciprocating said nozzle between a first position within said neck mold when said neck mold is in its first position and a second position removed from said neck mold to allow for the removal of the neck mold and the thus formed glass parisons, and a bottom presser for pressing the top of the glass parisons in the split faced mold when said neck mold and said nozzle are in their first positions, means for reciprocating said bottom presser between a first position in said mount of said split faced mold and a second position spaced from said first position, the improvement comprising a waste glass mounted below said second end of said catcher means for receiving the glass parisons when said catcher means is in its second position, a swabbing means for swabbing said split faced mold after the forming of an article, means for reciprocating said swabbing means between a first position above said mouth of said split faced mold and a second position within said mouth of said split faced mold, a vessel of lubricating material positioned above said mouth and movable between a first position directly beneath said swabbing means when said swabbing means is in its first position and in said vessel of lubricating material, and a second position spaced from said first position with said swabbing means spaced from said vessel of lubricating material, and means for reciprocating said vessel of lubricating material between said first position and said second position.

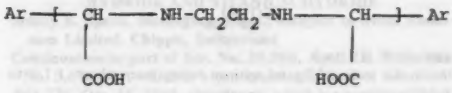
3,981,712

TREATMENT OF IRON DEFICIENCIES IN PLANTS WITH IRON COMPLEXES OF ETHYLENE-BIS-(α-IMINO-2-HYDROXYARYL ACETIC ACIDS)

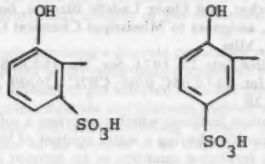
Harris E. Petree, Spanish Fort, and Joseph W. Stutts, Jackson, both of Ala., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

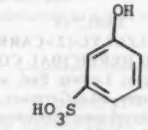
Division of Ser. No. 391,401, Aug. 24, 1973, Pat. No. 3,903,119. This application July 3, 1975, Ser. No. 593,099
Int. Cl.² C07F 15/02
U.S. Cl. 71—1 **4 Claims**

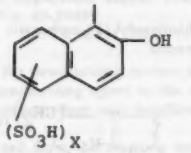
1. A composition of matter for the treatment of iron deficiencies in plants which comprises from about one-hundredth to about 50 percent by weight of at least one iron complex of ethylene-bis-(α-imino-2-hydroxyaryl acetic acid) as active ingredient of the formula

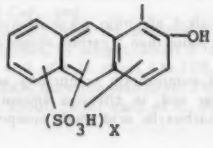


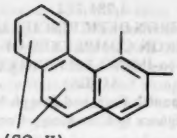
wherein Ar is selected from the group consisting of

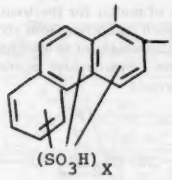












wherein X is 1 to 3
the molar ratio of ligand to iron being from about 1:1.1 to 1:3.0.

3,981,713

UREA-ZINC OXIDE COMPOSITION AND PROCESS

Gerald L. Tucker, and Elmer Ladelle Blanton, both of Yazoo City, Miss., assignors to Mississippi Chemical Corporation, Yazoo City, Miss.

Filed July 23, 1971, Ser. No. 165,698
Int. Cl.² C05C *9/00*; C07C *126/00*
U.S. Cl. 71—28 **10 Claims**

1. A particulate fertilizer which comprises a solidified solution of urea particles having a water content of less than 12% and having a fertilizing quantity in an amount of less than 27.5% of ZnO homogeneously dispersed throughout said urea.

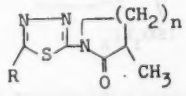
3,981,714

CYCLIC N-THIADIAZOLYL-(2)-CARBOXYLIC ACID COMPOUNDS AND HERBICIDAL COMPOSITIONS

Carl Metzger, Dormagen; Ludwig Eue, and Robert Rudolf Schmidt, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 24, 1975, Ser. No. 552,506
Claims priority, application Germany, Mar. 9, 1974, 2411288; Mar. 28, 1974, 2415056
Int. Cl.² C07D *417/04*
U.S. Cl. 71—90 **14 Claims**

1. Cyclic N-thiadiazolyl-(2)-carboxylic acid amide compounds of the formula:



(I)

wherein
R is alkyl, haloalkyl, alkylthio, alkylsulfonyl or alkoxy, and contains not more than 5 carbon atoms and
n is 1 or 2.

11. Herbicidal composition comprising an agriculturally acceptable carrier and, in effective amounts, a cyclic N-thiadiazolyl-(2)-carboxylic acid amide compound as claimed in claim 1.

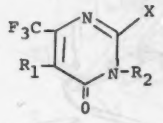
3,981,715

2,3,5-SUBSTITUTED-6-TRIFLUOROMETHYL-1,3-DIAZIN-4-ONES HERBICIDES

Albert William Lutz, Princeton, and Bryant Leonidas Walworth, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 237,936, March 24, 1972, Pat. No. 3,869,457, which is a continuation-in-part of Ser. No. 737,308, June 17, 1968, abandoned. This application Sept. 9, 1974, Ser. No. 504,230
Int. Cl.² A01N *9/22*
U.S. Cl. 71—92 **8 Claims**

1. A method for controlling undesirable plant species which comprises applying to soil containing the undesirable plant species a herbicidally effective amount of a compound of the formula:



wherein
R_1 is hydrogen or halo,
R_2 is alkyl of 1 to 12 carbon atoms, cyclohexyl, phenyl, allyl, hydrogen or mono or dihalo substituted alkyl of 1 to 12 carbon atoms, monocarb (loweralkoxy) substituted alkyl of 1 to 12 carbon atoms, mono or dihalo substituted phenyl, or mono or di CF_3 substituted phenyl, and X is hydrogen or hydroxy and where X is hydroxy, the tautomers and water soluble sodium, potassium, ammonium and tri(C_1–C_4 alkyl) ammonium salts.

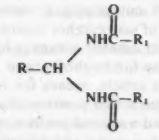
3,981,716

GEM-BIS AMIDE HERBICIDE ANTIDOTE COMPOSITIONS AND METHODS OF USE

Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 363,464, May 24, 1973, Pat. No. 3,923,494. This application May 22, 1975, Ser. No. 580,125
Int. Cl.² A01N *9/12*
U.S. Cl. 71—100 **28 Claims**

1. An herbicide composition comprising a mixture of a herbicidally effective amount of a thiocarbamate herbicide and an antidote compound corresponding to the formula



in which R is selected from the group phenyl, naphthyl and substituted phenyl wherein said substituents are selected from the group methoxy, nitro, chloro, bromo, mono- and di-substituted lower alkyl having from 1 to 4 carbon atoms, inclusive; and R_1 is lower chloroalkyl containing from 1 to 4 carbon atoms, inclusive; from about 0.01 to about 15 parts by weight of antidote compound for each part by weight of the thiocarbamate herbicide.

3,981,717

HERBICIDAL METHODS

Bryant Leonidas Walworth, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sept. 24, 1969, Ser. No. 860,796

Int. Cl.² A01N *9/20*

U.S. Cl. 71—105 **9 Claims**

1. A method for the control of undesirable plant species comprising contacting said plant species with a herbicidally effective amount of a compound methyl 2-cyano-3-(N-methylanilino) acrylate, n-octyl 2-cyano-3-(N-methylanilino) acrylate, ethyl 2-cyano-3-(N-methyl-3-chloroanilino)acrylate, ethyl 2-cyano-3-(N-methyl-3-methylanilino)acrylate, ethyl 2-cyano-3-(N-methyl-2-methylanilino) acrylate or ethyl 3-(N-phenyl-N-methyl)-amino-2-cyano acrylate.

3,981,718

METHOD FOR INCREASING THE SUCROSE CONTENT OF GROWING PLANTS

Ernest G. Jaworski, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

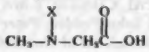
Filed Dec. 20, 1974, Ser. No. 535,076

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² A01N *9/24*

U.S. Cl. 71—113 **7 Claims**

1. A method for increasing the sucrose content of sugar cane plants which comprises applying to said plants, from about 2 to 8 weeks prior to harvest, an effective amount of a compound of the formula



wherein X represents hydrogen or methyl, and the non-phytotoxic, agriculturally acceptable salts thereof.

3,981,719

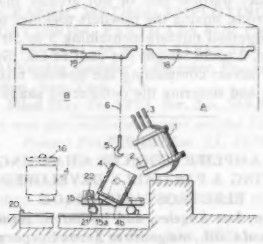
METHOD FOR RECEIVING MOLTEN STEEL FROM AN ELECTRIC FURNACE

Shoji Nakamura, Osaka, Japan, assignor to Kyoei Steel Works, Ltd., Osaka, Japan

Filed July 8, 1975, Ser. No. 594,072

Int. Cl.² C21C *5/52*

U.S. Cl. 75—13 **1 Claim**



1. A method for transferring molten metal from an electric furnace comprising the steps of:

positioning a ladle bogie along rails leading to said furnace, said rails being parallel to an extension of a line connecting the furnace center and a tapping trough of said furnace;

controlling the location of said ladle bogie along said rails by remote control;

mounting a ladle having trunnion shafts on two opposite sides thereof onto said ladle bogie, said ladle being tiltable about said trunnion shafts and being lined with fireproof material;

advancing said ladle bogie with said ladle thereon to a preheater positioned above and along said rails near said electric furnace;

preheating said ladle on said ladle bogie with said preheater;

advancing said preheated ladle on said ladle bogie on said rails to said electric furnace;

tilting said ladle about said trunnion shaft by lifting the bottom edge thereof opposite said furnace; and

pouring the molten metal in said furnace through said tapping trough into said preheated, tilted ladle, said tapping trough being short enough to prevent substantial heat loss from the molten metal passing therethrough.

3,981,720

FOAMING OF METAL BY THE CATALYZED AND CONTROLLED DECOMPOSITION OF ZIRCONIUM HYDRIDE AND TITANIUM HYDRIDE

Sidney E. Speed, Stonington, Conn., assignor to Swiss Aluminum Limited, Chippis, Switzerland

Continuation-in-part of Ser. No. 30,886, April 22, 1970, Pat. No. 3,676,071, which is a continuation-in-part of Ser. No. 866,776, Oct. 15, 1969, abandoned, which is a continuation of Ser. No. 593,969, Nov. 14, 1966, abandoned. This application Feb. 7, 1972, Ser. No. 224,104

Int. Cl.³ C22B *5/02*

U.S. Cl. 75—20 F **8 Claims**

1. A process for producing foamed metal by catalyzing and controlling the solid state decomposition of a material which releases a substantial amount of gas in molten metal which comprises:

A. intimately admixing a discrete particulate material which decomposes at elevated temperatures to release a substantial amount of gas selected from the group consisting of zirconium hydride and titanium hydride and a discrete particulate material containing a major proportion of aluminum in an amount of at least 0.8 part by weight based on the amount of aluminum per part of decomposable material;

B. heating said admixture at a temperature range of 850° to 900°F for at least 5 minutes to form a surface oxide layer upon said hydride; and

C. adding said admixture to a melt of molten metal to foam said metal.

3,981,721

METHOD FOR DESULFURIZING MOLTEN IRON

Masaru Takashima, Komae, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1975, Ser. No. 553,709

Claims priority, application Japan, Feb. 27, 1974, 49-22341; Apr. 9, 1974, 49-39499

Int. Cl.² C21C *7/02*

U.S. Cl. 75—58 **10 Claims**

1. In a method for desulfurizing molten iron, which comprises adding a desulfurizing agent to the molten iron, the improvement which comprises said desulfurizing agent being at least one of:

a. a dust collected from the smelting step of manganese which comprises by weight, about 2 to 20% of Na_2O, about 5 to 50 % of K_2O, about 20 to 40 % of MnO, about 5 to 30% of CaO, about 3 to 20 % of SiO_2 about 3 to 10 % of C, and not more than about 5 % of each of Al_2O_3 Fe_2O_3, and CaF_2; and

b. a dust collected from the smelting step of chromium which comprises, by weight, about 3 to 25 % of Na_2O, about 4 to 40% of K_2O, about 4 to 15% of CaO, about 5 to 30 % of SiO_2, not more than about 5% of Cr_2O_3 and not more than about 5% of each of C, Al_2O_3, Fe_2O_3, and CaF_2.

3,981,722

AMORPHOUS ALLOYS IN THE U-CR-V SYSTEM

Ranjan Ray, and Elisabeth Musso, both of Morristown, N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Oct. 31, 1974, Ser. No. 519,887
Int. Cl.² C22C *43/00*
U.S. Cl. 75—122.7 **4 Claims**

1. A uranium base metal alloy which is at least 50 percent amorphous comprising about 60 to 80 atom percent of uranium and about 20 to 40 atom percent of chromium and/or vanadium, and a maximum of about 10 atom percent of other alloying elements replacing chromium and/or vanadium.

3,981,723

WHITE GOLD ALLOY

Joseph J. Tuccillo, Norwalk, Conn., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 370,496, June 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 190,686, Oct. 19, 1971, abandoned. This application June 26, 1974, Ser. No. 483,256
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976
Int. Cl.² C22C *5/02*
U.S. Cl. 75—165 **9 Claims**

1. A white gold alloy for dental castings which is characterized by having, after heat treatment by heating to 1900°F. at a rate of 75° to 100°F. per minute and maintaining at 1900°F. for about 10 minutes and cooling, an ultimate tensile strength of at least about 90,000 psi., a yield strength of at least about 70,000 psi., and a Brinell hardness number of at least about 170, consisting essentially, in percent by weight, of 50 to 54% gold; 27 to 31% palladium; 11 to 16% silver; about 0.05 to about 0.25% of iridium or ruthenium, and a total of 4.5 to 8% of indium and tin, provided there is at least 2% indium and no more than 4.5% tin, and further provided that if there is less than about 6% indium, there must be at least 0.25% tin.

3,981,724

ELECTRICALLY CONDUCTIVE ALLOY

Janniah S. Prasad, Norwalk, Conn., assignor to Consolidated Refining Company, Inc., Mamaroneck, N.Y.

Filed Nov. 6, 1974, Ser. No. 521,393
Int. Cl.² C22C *5/06*
U.S. Cl. 75—173 R **1 Claim**

1. An alloy consisting essentially of silver, gold and platinum, there being from 0.1 to 0.5% by weight based on said alloy of each of said gold and said platinum.

3,981,725

PROCESS AND SYSTEM FOR FORMING FINISHED PARTS FROM POWDER METAL

William F. Dixon, Rochester, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Mar. 6, 1974, Ser. No. 448,783
Int. Cl.² B22F *1/00, 3/24, 3/00*
U.S. Cl. 75—200 **9 Claims**

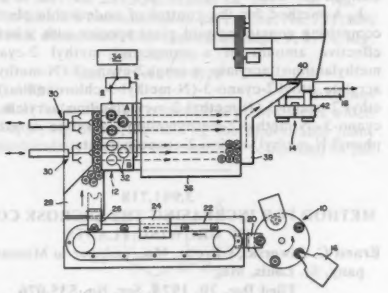
1. In an industrial process for forming finished parts from metal powder by initially compacting a measured quantity of metal powder into a coherent preliminary part having an intermediate shape, followed by steps of heating and forming the preliminary part into a finished part having a final shape and density, the improvement of integrating the steps of such a process into a single automated system, comprising

compacting loose powder metal with a process which produces a continuous flow of preliminary parts,

conveying and transferring said preliminary parts to an induction sintering station,

rearranging the continuous flow of preliminary parts into separate batches in the induction sintering station so that separate batches of the preliminary parts can be uniformly heated to a selected sintering temperature level in alternating time sequence,

removing the batches of preliminary parts from the induction sintering station after sintering is completed, and rearranging the batches of preliminary parts back into a



flow of parts which can be conveyed to a final forming station, and

transferring parts from said flow of parts to a forming station where said preliminary parts are formed into finished parts having a final shape and density.

3,981,726

ELECTRICAL CONTACT MATERIALS

Peter Douglas; David John Pedder; Peter John Swallow, and Terrence Ardern Davies, all of Northampton, England, assignors to Square D Company, Park Ridge, Ill.

Division of Ser. No. 384,161, July 30, 1973, Pat. No. 3,922,236. This application June 13, 1975, Ser. No. 586,763
Claims priority, application United Kingdom, Aug. 1, 1972, 35826/72
Int. Cl.² B22F *1/00, 3/00*
U.S. Cl. 75—206 **11 Claims**

1. A method of producing an electrical contact material including the steps of providing irregular silver powder having a powder particle size of not greater than approximately 350 mesh; providing irregular copper powder having a powder particle size of not greater than approximately 350 mesh; providing lanthanum strontium chromite powder of formula $La_{1-x}Sr_xCrO_3$, where the values lie between 0 and 1.0, and having a powder particle size of not greater than approximately 10 microns; mixing the powders together to provide a fine, evenly dispersed mixture containing 5 to 50 weight per cent of copper, 2 to 20 weight per cent of $La_{1-x}Sr_xCrO_3$ and the remainder silver; compacting the powder mixture into a desired shape; and sintering the compacted shape.

3,981,727

SIGNAL AMPLIFICATION BY CHARGING AND ILLUMINATING A PARTIALLY DEVELOPED LATENT ELECTROSTATIC IMAGE

Alan C. Nelson, Los Angeles, and Lothar S. Jeromin, Sierra Madre, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed June 5, 1974, Ser. No. 476,348
Int. Cl.² G03G *13/24*
U.S. Cl. 96—1.3 **5 Claims**

1. A method of increasing the potential difference between two adjacent charge patterns of differing charge density formed on a photoconductive surface comprising the steps of:

a. providing a photoconductive surface having at least two adjacent charge patterns of differing charge density thereon, said charge patterns being of a first polarity,

b. depositing a developer powder which is charged to said first polarity on said photoconductive surface whereby

said developer powder is deposited denser in the areas of lower surface charge density, than in the areas of higher surface charge density, thereby providing a developed charge pattern,

c. uniformly applying charge of said first polarity to said developed charge pattern,

d. exposing the charged developed charge pattern to light, and

e. thereafter applying additional developer powder charged to a second polarity to said developed charge pattern whereby the potential difference between adjacent charge patterns of differing density is at least equal to the initial potential difference therebetween.

3,981,728

XEROGRAPHIC IMAGING MEMBER HAVING HEXAGONAL SELENIUM IN INTER-LOCKING CONTINUOUS PATHS

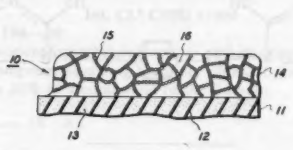
Robert N. Jones, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 518,554, Oct. 29, 1974, Pat. No. 3,928,036. This application July 24, 1975, Ser. No. 598,613

The portion of the term of this patent subsequent to Jan. 22, 1991, has been disclaimed.

Int. Cl.² G03G 5/087

U.S. Cl. 96—1.5 20 Claims



1. A xerographic imaging member which includes a photoconductive insulating layer, said layer comprising an insulating organic matrix and hexagonal selenium, with substantially all of the hexagonal selenium in said member in a multiplicity of interlocking hexagonal selenium continuous paths through the thickness of said layer, said hexagonal selenium paths being present in a volume concentration, based on the volume of said layer, of from about 1 to 25 percent, with the outer surface of said layer comprising organic resin material.

3,981,729

PHOTOGRAPHIC METHOD EMPLOYING ORGANIC LIGHT-SCATTERING PARTICLES FOR PRODUCING A VIEWING-SCREEN STRUCTURE

Theodore Alexander Saulnier, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 14, 1973, Ser. No. 359,901

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² G03C 5/00

U.S. Cl. 96—36.1 3 Claims

1. A method for producing a luminescent screen structure including the steps of

a. coating a supporting surface with a film consisting essentially of (i) organic polymeric binder material whose solubility in a given solvent is altered when it is exposed to radiant energy, said binder material being volatilized when heated in air below about 500°C and (ii) about 10 to 80 weight percent with respect to the weight of said binder material of particles of an organic material that is insoluble in said binder material and selected from the group consisting of acrylic and polystyrene polymers, said particles being volatilized when heated in air at temperatures below about 500°C and being about 0.3 to 1.0 micron median size, said organic particles being adapted to scatter said radiant energy in said film,

b. exposing said film to an image in the form of said radiant energy until the solubility of the irradiated portions thereof is selectively altered, thereby producing in said film regions of greater solubility and regions of lesser solubility,

c. removing those regions of said film with greater solubility with a liquid solvent therefor while retaining said regions with lesser solubility, thereby baring the areas of said supporting surface underlying said regions of greater solubility, while retaining those regions of said film of lesser solubility,

d. then, while said retained film regions are wet with said solvent, adhering dry particles of screen-structure material to said film regions of lesser solubility,

e. and then baking said retained film regions with said adhered particles thereon in air at temperatures below about 500°C until said binder material and said organic particles are substantially entirely volatilized.

3,981,730

DIAZO-TYPE MULTICOLOR REPRODUCTION PROCESS

Kenzi Takahashi; Toshihiro Kouchi, both of Hirakata; Yasutoki Kamezawa, Tsuzuki, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

Filed Apr. 16, 1974, Ser. No. 461,444

Claims priority, application Japan, Apr. 18, 1973, 48-43050; Apr. 18, 1973, 48-43051

Int. Cl.² G03C 5/34

U.S. Cl. 96—49 17 Claims

1. In a process for multi-color reproduction, which comprises:

A. exposing image-wise a diazo-type photosensitive material to actinic light by exposing through an original sheet of an assembly, said assembly consisting of (i) an original sheet having opaque image areas and transparent or semi-transparent non-image areas on one surface and a color-forming layer containing at least one thermovolatile or sublimable azo coupler (a), said layer being located in only preselected areas which are contiguous with opaque image areas of said original sheet, said preselected areas being present in only a portion of the areas contiguous with said opaque image areas of said original sheet, and (ii) a diazo-type photosensitive material having a photosensitive layer containing at least one photosensitive diazonium salt (c), an acidic stabilizer and an azo coupler (b) having a substantially lower rate of coupling with the diazonium salt (c) under the developing conditions than that of the azo coupler (a) said original sheet (i) being superimposed on said diazo-type photosensitive material (ii) so that the color-forming layer comes into face-to-face contact with the photosensitive layer;

B. heating said assembly to thereby heat-transfer said layer of the coupler (a) to the corresponding position on the surface of said photosensitive layer, said steps (A) and (B) being performed simultaneously or in the time sequence of (A) to (B) or (B) to (A); and

C. contacting the exposed photosensitive material with a mixture of ammonia and steam or an alkali-containing aqueous liquid developer to thereby develop said photosensitive material, whereby in the unexposed latent image area of the portion to which the coupler (a) has been heat-transferred, a dye (c)–(a) having a certain hue or color is formed by the selective reaction of the heat-transferred coupler (a) with the diazonium salt (c) and at the same time, in the unexposed latent image areas to which the coupler (a) has not been heat-transferred, a dye (c)–(b) having a different hue or color from said dye (c)–(a) is formed by the reaction of the coupler (b) with the diazonium salt (c), thus producing a multi-colored copied image, the improvement wherein in addition to the thermo-volatile or sublimable coupler (a), the color-

forming layer contains a hue separation-improving agent selected from the group consisting of

a. polyalkylene oxides having recurring units represented by the following formula

$$\text{-(RO)}_n\text{-}$$

wherein R is an alkylene group having 2 to 4 carbon atoms, and n is a number so selected that the polymer is solid under conditions of 20°C and one atmosphere pressure,

b. carboxylic acid esters and ethers of polyalkylene oxide as described above,

c. adducts between ethylene oxide or propylene oxide and stearic acid amide, lauric acid amide or oleic acid amide, and

d. fatty acid amides other than said adducts, fatty acid imides, fatty acid aminoalkyl esters, fatty acid salts and condensates of fatty acid amide with formaldehyde, the melting point of which is 100°C or higher.

2. A process for multi-color reproduction, which comprises:

A. exposing image-wise a diazo-type photosensitive material to actinic light by exposing through an original sheet of an assembly, said assembly consisting of (i) an original sheet having opaque image areas and transparent or semi-transparent non-image areas on one surface and a color-forming layer containing at least one thermovolatile or sublimable azo coupler (a), said layer being located in only preselected areas which are contiguous with opaque image areas of said original sheet, said preselected areas being present in only a portion of the areas contiguous with said opaque image areas of said original sheet, and (ii) a diazo-type photosensitive material having a photosensitive layer containing at least one photosensitive diazonium salt (c), said original sheet (i) being superposed on said diazo-type photosensitive material (ii) so that the color-forming layer comes into face-to-face contact with the photosensitive layer;

B. heating said assembly to thereby heat-transfer said layer of the coupler (a) to the corresponding position on the surface of said photosensitive layer, said steps (A) and (B) being performed simultaneously or in the time sequence of (A) to (B) or (B) to (A); and

C. thereafter developing the exposed photosensitive layer with an alkaline aqueous liquid developer containing a coupler (b), wherein said coupler (a) has a higher coupling rate under developing conditions than said coupler (b), whereby in the unexposed latent image area of the portion to which the coupler (a) has been heat-transferred, a dye (c)-(a) having a certain hue or color is formed by the selective reaction of the heat-transferred coupler (a) with the diazonium salt (c) and at the same time, in the unexposed latent image areas to which the coupler (a) has not been heat-transferred, a dye (c)–(b) having a different hue or color from said dye (c)–(a) is formed by the reaction of the coupler (b) with the diazonium salt (c), thus producing a multi-colored copied image, the improvement wherein in addition to the thermo-volatile or sublimable coupler (a), the color-forming layer contains a hue separation-improving agent selected from the group consisting of

a. polyalkylene oxides having recurring units represented by the following formula

$$\text{-(RO)}_n\text{-}$$

wherein R is an alkylene group having 2 to 4 carbon atoms, and n is a number so selected that the polymer is solid under conditions of 20°C. and one atmosphere pressure,

b. carboxylic acid esters and ethers of polyalkylene oxide as described above,

c. adducts between ethylene oxide or propylene oxide and stearic acid amide, lauric acid amide or oleic acid amide, and

d. fatty acid amides other than said adducts, fatty acid imides, fatty acid aminoalkyl esters, fatty acid salts and condensates of fatty acid amide with formaldehyde condensates, the melting point of which is 100°C or higher.

3,981,731

STABILIZATION OF DEVELOPED PHOTOGRAPHIC IMAGES

Werner Berthold; Anita von König, both of Leverkusen, and Helmut Timmler, Wuppertal, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

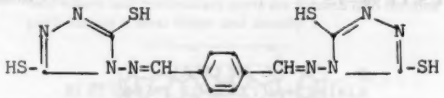
Filed Nov. 4, 1975, Ser. No. 628,660

Claims priority, application Germany, Nov. 9, 1974, 2453218

Int. Cl.² G03C *5/26, 5/38, 1/06*

U.S. Cl. 96—50 R **6 Claims**

1. In a process for the production of photographic images by exposure of a photographic material which contains at least one silver halide emulsion layer, development and stabilization of the unexposed and undeveloped silver halide, the improvement according to which development is carried out with a bath containing a compound of the following formula or salts thereof



3,981,732

GRANULAR p-PHENYLENEDIAMINE COLOR DEVELOPING AGENT

Takeo Emoto, Fujisawa, and Satoshi Kurihara, Hiratsuka, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Division of Ser. No. 281,672, Aug. 18, 1972, Pat. No. 3,833,377. This application Apr. 9, 1974, Ser. No. 459,446

Claims priority, application Japan, Aug. 19, 1971, 46-63231

Int. Cl.² G03C *5/30, 7/00*

U.S. Cl. 96—66.2 **5 Claims**

1. A granular color developing composition consisting essentially of granules which comprise p-phenylenediamine color developing agent, wherein said granules will not pass through a 250μ sieve and are dust-free and free-flowing, wherein said granular color developing composition is formed by a process which comprises:

a. mixing and kneading at least one excipient selected from the group consisting of water and lower alcohols and a p-phenylenediamine color developing agent;

b. extruding the resulting mixture to mold said mixture into a rod; and

c. drying the resulting extrudate to remove the excipient.

3,981,733

SILVER HALIDE PHOTOGRAPHIC MATERIALS CONTAINING THE ADDITION PRODUCTS OF LOWER ALKYLENE OXIDES AND ORGANIC POLYAMINES AS ANTI-FOG COMPOUNDS

Max Van Dam, Oradell, N.J., and Stephen Robert Gallo, Yonkers, N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

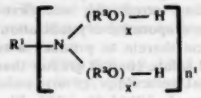
Filed July 31, 1974, Ser. No. 493,281

Int. Cl.² G03C *1/34*

U.S. Cl. 96—67 **13 Claims**

1. A photosensitive a silver halide photographic emulsion containing a water soluble anti-fog compound of the following

formula:



where R^1 is a lower alkylene radical having up to 6 carbon atoms,

$-R^2O-$ and $-R^3O-$ are the same or different lower oxyalkylene radicals,

the sum of x and x' such that said compound has greater than about 33 to about 500 $-R^2O-$ radicals and $-R^3O-$ radicals,

n^1 is a value greater than 1 and up to 2,

said compound being present in said emulsion in an amount sufficient to reduce the fog of said emulsion.

3,981,734

STABLE PIGMENT COMPOSITIONS

Louis Antoine Cabut, Nogent sur Oise, and Michel Ernest Antoine Huille, Creil, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed July 15, 1975, Ser. No. 596,132

Claims priority, application France, July 19, 1974, 74.25131

Int. Cl.² C09D *11/00*

U.S. Cl. 106—20 **7 Claims**

1. A process for stabilizing copper phthalocyanine pigments which comprises admixing a copper phthalocyanine pigment with 1 to 20% of a compound of the formula:

$$Pc \text{ —— } (X - A)_n$$

wherein Pc represents the unmetallized or metallized phthalocyanine moiety, X represents oxygen, sulfur or —NH—,

A represents straight or branched chain alkyl having 4 to 20 carbons, unsubstituted aryl or aryl substituted by halogen, trifluoromethyl, alkyl or alkoxy,

and n is a number from 1 to 8.

2. A pigment composition consisting of an admixture of a copper phthalocyanine pigment with 1 to 20% of a stabilizing compound of the formula:

$$Pc \text{ —— } (X - A)_n$$

wherein Pc represents the unmetallized or metallized phthalocyanine radical,

X represents oxygen, sulfur or —NH—,

A represents straight or branched chain alkyl having 4 to 20 carbon atoms, unsubstituted aryl or aryl substituted by halogen, trifluoromethyl, alkyl or alkoxy,

and n is a number from 1 to 8.

7. In a printing ink, the improvement which comprises having present therein the pigment composition as defined in claim 2.

3,981,735

PROCESS FOR MAKING A STABLE, RELATIVELY HIGH CONCENTRATION, SOLUTION OF AN ORGANIC COLOR-REACTIVE COLORLESS DYE IN OIL

Minoru Murata; Koichi Sugiyama, both of Hiratsuka, and Hisao Ikeda, Fujisawa, all of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 20, 1974, Ser. No. 452,883

Claims priority, application Japan, Apr. 16, 1973, 48-43005

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² C09D *11/06*

U.S. Cl. 106—27 **11 Claims**

1. A stable, colorless, liquid ink composition comprising an organic peroxide compound dissolved in substantially water insoluble organic oil and complexed with a color reactive dye material.

3,981,736

BIOCOMPATIBLE GLASS CERAMIC MATERIAL

Heinz Broemer, Hermannstein; Hans-Herbert Kaes, Wetzlar-Dorlar, and Emanuel Pfeil, Marburg, all of Germany, assignors to Ernst Leitz G.m.b.H., Wetzlar, Germany

Division of Ser. No. 471,891, May 21, 1974, Pat. No. 3,922,155. This application May 12, 1975, Ser. No. 576,797

Claims priority, application Germany, May 23, 1973, 2326100

Int. Cl.² A61F *1/00*; C03C *3/22*

U.S. Cl. 106—39.6 **4 Claims**

1. An apatite-containing glass ceramic material of satisfactory biocompatibility, said material being formed by thermal crystallization of a glass consisting essentially, in weight percent, of

Between about 20 and about 60 percent of silicon dioxide SiO_2,

between about 5 and about 40 percent of phosphorus pentoxide P_2O_5,

between about 2.7 and about 20 percent of sodium oxide Na_2O,

between about 0.4 and about 20 percent of potassium oxide K_2O,

between about 2.9 and about 30 percent of magnesium oxide MgO, and

between about 5 and about 40 percent of calcium oxide CaO.

3,981,737

PROCESS FOR PRODUCING LIGHTPROOF TITANIUM DIOXIDE PIGMENT

Toivo Evilampi, and Virpi Laamanen, both of Pori, Finland, assignors to Kemira Oy, Finland

Filed Feb. 14, 1974, Ser. No. 442,409

Claims priority, application Finland, Feb. 20, 1973, 493/73

Int. Cl.² G04B *31/02*

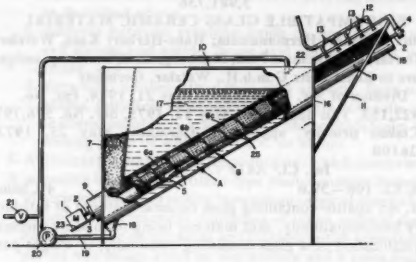
U.S. Cl. 106—300 **10 Claims**

1. In a process for producing a substantially lightproof titanium dioxide pigment suitable for matting artificial fibers, in which a water soluble vanadium compound which is a vanadate or vanadyl salt is added to an aqueous suspension of the titanium dioxide pigment to form a precipitate of a vanadium hydroxide in the amount of 0.01–0.5 percent of the weight of the pigment calculated as V_2O_5 on the surface of the titanium dioxide particles, whereafter the suspension is filtered, washed, and the washed precipitate is thermally dried, and ground, the improvement comprising adding to said aqueous suspension an aluminum compound, which is an aluminate or aluminum salt so as to cause a precipitate of a vanadium hydroxide and an aluminum hydroxide on said titanium dioxide particles, the amount of said aluminum hydroxide being 0.5–5 percent of the weight of the pigment calculated as Al_2O_3 and effecting the thermal drying and the grinding at such a low temperature that the pigment temperature is between 105°C and 300°C and for such a short period that the vanadium hydroxide remains on the surface of the titanium dioxide pigment particles without being calcinated into the particles.

3,981,738
GLUTEN WASHING AND DEWATERING DEVICE

Ganta Venkateswara Rao, Hutchinson; Dale Albert Garinger, Buhler, and Floyd Kent Shoup, Hutchinson, all of Kans., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 18, 1976, Ser. No. 659,160
Int. Cl.[2] C13L *1/00*
U.S. Cl. 127—25 **22 Claims**



1. A device for separating wheat gluten from wheat starch, bran, and germ, said device comprising:

a. an armature fixed at a angle greater than horizontal, said armature thus having a lower and upper end, including

i. a cylinder having a smaller diameter at the lower end of said armature and a larger diameter at the upper end of said armature, said cylinder including a plurality of peaked, elbow-shaped ridges on its exterior surface;

ii. helical flights set in a spiral around and protruding outwardly from said cylinder, said flights having substantially the same diameter throughout the entire length of said cylinder;

b. means for spraying liquid onto the upper end of said armature;

c. a stator substantially enveloping the length and circumference of said armature and spaced at a substantially constant distance from said helical flights, said stator being foraminous over a major portion thereof;

d. tank means for retaining liquid around and within at least a portion of said stator and for collecting liquid introduced by said spraying means, said tank means having a lower and upper end; and

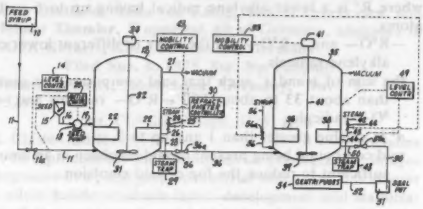
e. feed means communicating with the interior of said stator at the lower end of both said stator and said armature for introducing a gluten-containing wheat product.

3,981,739
CONTINUOUS CRYSTALLIZATION

Morris Dmitrovsky, Roslyn Heights, N.Y., and Antoine H. Kokke, Rosemont, Pa., assignors to Amstar Corporation, New York, N.Y.

Filed Aug. 30, 1974, Ser. No. 501,862
Int. Cl.[2] C13F *1/02*; C13K *1/10*, *5/00*, *11/00*
U.S. Cl. 127—60 **44 Claims**

36. A method of continuously crystallizing crystallizable solute from a solution containing said solute which comprises substantially continuously introducing said solution into a first stage evaporative-crystallization zone, substantially continuously introducing into said first stage evaporative-crystallization zone seed crystals of said solute, concentrating the solution thus-introduced into said first stage evaporative-crystallization zone to produce therein a first stage solution having said solute dissolved therein at a concentration greater than the concentration of said solute in said solution with concomitant growth and production of crystals of said solute in said first stage solution, said solute crystals in said first stage solution having an average crystal size substantially greater than the average crystal size of said solute seed crystals, substantially continuously withdrawing a stream of said first stage solution from said first stage evaporative-crystallization zone and substantially continuously introducing said first stage solution into a second stage evaporative-crystallization zone for evaporative crystallization therein to produce a second stage solution having a total solute content greater than that



of said first stage solution and containing solute crystals having an average crystal size substantially greater than the average crystal size of the crystals of said solute in said first stage solution and substantially continuously withdrawing said second stage solution from said second stage evaporative-crystallization zone.

3,981,740
METHOD FOR THE REMOVAL AND INHIBITION OF METAL SCALE FORMATION IN A HYDROCARBON PROCESSING UNIT

George J. Czajkowski, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 19, 1974, Ser. No. 462,479
Int. Cl.[2] C23F *9/02*, *11/16*, *14/02*
U.S. Cl. 134—2 **2 Claims**

1. A method of removing metal oxide and mill scale and inhibiting further metal scale formation in a catalytic hydrocarbon conversion processing unit having internal steel surfaces, which comprises simultaneously circulating through said unit, prior to the first cycle catalytic conversion therein, a normally liquid hydrocarbon selected from the group consisting of gas oil, kerosene, straight-run naphtha, and black oils, a gas containing primarily hydrogen, and a sulphur compound selected from the group consisting of hydrogen sulfide, alkyl mercaptans and alkyl sulfides while heating said unit to a temperature of from about 400°F. to about 1200°F., thereby separating loosely bound metal scale from the internal surfaces of the processing unit, and removing thus separated metal scale from the processing unit prior to the catalytic conversion therein.

3,981,741
FIBROUS CLEANING MATERIALS IMPREGNATED WITH A LATEX-MIXTURE

Hirokazu Iino, 4/40, Kasumi-cho, Nishinomiya, Hyogo, Japan

Division of Ser. No. 416,510, Nov. 16, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 555,046
Claims priority, application Japan, Nov. 16, 1972, 47-115082
Int. Cl.[2] B08B *7/00*; A47L *1/08*, *13/16*
U.S. Cl. 134—6 **8 Claims**

1. A method of cleaning a soiled surface comprising rubbing in the presence of water the surface to be cleaned with a fibrous cleaning material consisting essentially of a fibrous carrier which is impregnated with a mixture of (1) a latex of at least one rubber selected from the group consisting of natural rubber, butadiene rubber and styrene-butadiene rubber and (2) a polar high molecular weight substance selected from the group consisting of polyvinyl acetate, vinyl acetate-ethylene copolymer, acrylonitrile-butadiene copolymer, polychloroprene and acrylic resin and thereafter drying.

3,981,742

HIGH POWER LEAD ACID BATTERY

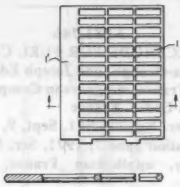
Kunio Yonezu; Masaharu Tsubota, and Kenji Asai, all of Kyoto, Japan, assignors to Japan Storage Battery Co., Ltd., Kyoto, Japan

Filed Feb. 10, 1975, Ser. No. 548,842

Claims priority, application Japan, Feb. 9, 1974, 49-16730; Mar. 18, 1974, 49-31482; June 8, 1974, 49-66711; June 8, 1974, 49-65387

Int. Cl.² H01M 4/36

U.S. Cl. 429—123 10 Claims



1. A lead acid battery including a container enclosing assembled elements each of which comprises a plurality of positive and negative plates each of which is composed of a grid filled with active material and formed with an integral band-shaped portion along the length of only one end thereof facing a side wall of the container, said plates being layered one upon another with separators therebetween in such a way that the respective band-shaped portions for the positive plates and negative plates respectively face opposite side walls of the container, a positive strap connected to said positive plates along at least a part of the length of the band-shaped portions thereof, and a negative strap connected to said negative plates along at least a part of the length of the band-shaped portions thereof.

3,981,743

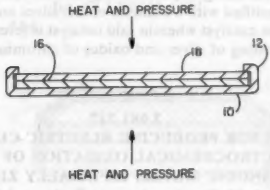
METHOD OF PREPARING A LITHIUM-ALUMINUM ELECTRODE

James Clement Schaefer, N. Royalton Cuyahoga, Ohio, assignor to ESB Incorporated, Philadelphia, Pa.

Filed June 6, 1975, Ser. No. 584,629

Int. Cl.² H01M 35/18, 4/26

U.S. Cl. 429—218 6 Claims



1. The method for preparing a negative lithium-aluminum electrode comprising the steps of:

a. forming a sandwich comprised of sheets of lithium and aluminum such that lithium is disposed between the aluminum layers of the sandwich; and

b. heat soaking the sandwich of step (a) at a temperature below the melting point of lithium while simultaneously applying pressure to the sandwich to assure contact between the abuting surfaces of lithium and aluminum sheets making up the sandwich of step (a) thereby causing the lithium and aluminum to chemically react to form aa lithium-aluminum alloy.

3,981,744

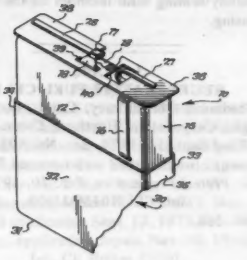
ENCLOSURE FOR LITHIUM-IODINE CELL AND METHOD OF MAKING THE SAME

Wilson Greatbatch, Clarence, and Ralph T. Mead, Kenmore, both of N.Y., assignors to Wilson Greatbatch, Ltd., Clarence, N.Y.

Continuation of Ser. No. 328,312, Jan. 31, 1973, abandoned. This application Oct. 8, 1974, Ser. No. 513,127

Int. Cl.² H01M 4/36

U.S. Cl. 429—178 15 Claims



1. A lithium-iodine cell enclosure comprising:

a. a first hollow casing of a material which is non-reactive with iodine and having an opening at one end, said casing containing a lithium-iodine cell comprising a lithium anode, iodine-containing cathode material and a lithium iodide electrolyte;

b. closure means of a material which is non-reactive with iodine for sealing the opening in said first casing;

c. a second hollow casing enclosing said first casing, said second casing having an opening at one end which is closed by a closure means sealed thereto, said second casing being inverted relative to said first casing whereby said closure means of said first casing is adjacent an end of said second casing opposite said closure means of said second casing so that any iodine-containing material which may happen to leak past said closure means of said first casing must flow along the entire dimension of said first casing before reaching said closure means of said second casing thereby minimizing the probability of any damaging effects from such leakage;

d. said first and second casings being generally of the same shape and in relatively close-fitting relation;

e. a third hollow casing enclosing said first and second casings, said third casing having an opening at one end and which is closed by a lid member hermetically sealed to said third casing; and

f. spacing means between said second casing and said lid member of said third casing for providing a space to receive any substances released from said first or second casings.

12. A method of enclosing a lithium-iodine cell comprising the steps of:

a. providing a first hollow casing of a material which is non-reactive with iodine and having an opening at one end;

b. placing a lithium anode and a cathode current collector in said first casing in spaced relation to each other;

c. introducing iodine-containing material into said first casing and in operative contact with said lithium anode and said cathode current collector;

d. sealing the opening in said first casing;

e. placing said first casing in a second hollow casing having an opening at one end in a manner such that said second casing is inverted relative to said first casing with the sealed end of said first casing adjacent an end of said second casing opposite the opening in said second casing;

f. introducing potting material into said second casing in a manner encapsulating said first casing, said potting material being non-reactive with iodine;
g. sealing the opening in said second casing;
g. whereby any iodine-containing material which may happen to leak through the sealed end of said first casing must flow along the entire dimension of said first casing before reaching the sealed end of said second casing thereby minimizing the probability of any damaging effects from such leakage;
i. placing said first and second casings in a third hollow casing having an opening at one end; and
j. hermetically sealing a lid member to the opening in said third casing.

3,981,745
REGENERATIVE FUEL CELL

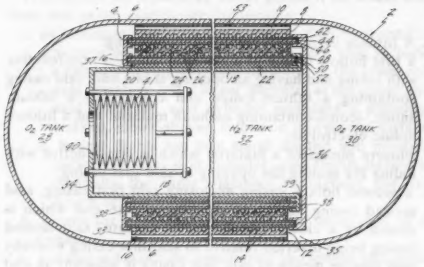
James K. Stedman, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sept. 11, 1974, Ser. No. 505,126

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² H01M 33/00

U.S. Cl. 204—266 **1 Claim**



1. A regenerative fuel cell system which operates on hydrogen and oxygen, comprising:

a housing:

a first assembly disposed in said housing including a fuel cell having a hydrogen electrode, a first oxygen electrode and an electrolyte matrix disposed therebetween, and including a first oxygen passage in fluid communication with said first oxygen electrode, said first oxygen electrode being composed of a first material;

a second assembly disposed in said housing including an electrolysis cell having a hydrogen electrode, a second oxygen electrode and an electrolyte matrix disposed therebetween, and including a second oxygen passage in fluid communication with said second oxygen electrode, said second oxygen electrode being composed of a second material different from said first material, said fuel cell hydrogen electrode and said electrolysis cell hydrogen electrode being spaced apart and in facing relationship;

a water matrix disposed in the space between and in contact with said fuel cell hydrogen electrode and said electrolysis cell hydrogen electrode and including portions bridging said hydrogen electrodes for transporting water produced by said fuel cell during fuel cell operation to said electrolysis cell for use during electrolysis cell operation, said water matrix shaped to define hydrogen passages in communication with said fuel cell hydrogen electrode and said electrolysis cell hydrogen electrode, said first assembly having a water storage matrix associated with one of said fuel cell electrodes for storing water produced by said fuel cell during fuel cell operation, said water storage matrix being adjacent said first oxygen electrode of said fuel cell and in fluid communication with said water matrix;

fluid connecting means in communication with said hydrogen passages and said oxygen passages for providing hydrogen to said hydrogen passages and oxygen to said oxygen passages, and including seal means preventing said hydrogen passages from communicating with said oxygen passages; and

means for operating said first assembly always as a fuel cell and said second assembly always as an electrolysis cell, said means being in electrical communication with said assemblies.

3,981,746
ELECTRODE FOR FUEL CELL

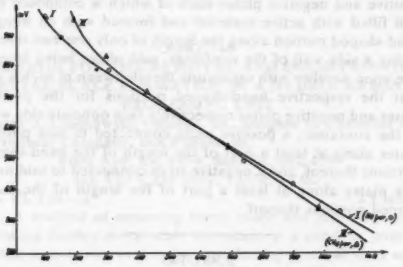
Jean Bezaudun, Ris-Orangis, and Joseph Edouard Weisang, Le Havre, both of France, assignors to Compagnie Francaise de Raffinage, Paris Cedex, France

Continuation of Ser. No. 776,841, Sept. 9, 1968, abandoned. This application June 7, 1971, Ser. No. 150,827

Claims priority, application France, Sept. 7, 1967, 67.120332

Int. Cl.² H01M 4/00, 8/00

U.S. Cl. 429—13 **7 Claims**



1. A fuel cell having an electrolyte of solid, fritted ceramic, suitable for operation at high temperatures and for operation on a hydrocarbon or hydrogen as a fuel and oxygen or oxygen containing gas as a comburant, consisting essentially of an electrolyte of a cubic-phase stabilized zirconia, a cathode, and an anode therefor, said anode being porous and consisting essentially of an electron collector wherein said collector is selected from the group consisting of cubic-phase stabilized zirconia modified with a uranium oxide, silver and copper and an oxidation catalyst wherein said catalyst is selected from the group consisting of silver and oxides of chromium, and vanadium.

3,981,747
PROCESS FOR PRODUCING ELECTRIC CURRENT BY THE ELECTROCHEMICAL OXIDATION OF AN ACTIVE ANODIC METAL, ESPECIALLY ZINC

Denis Doniat, Moillesulaz; Augusto Porta, and Bernard Bugnet, both of Geneva, all of Switzerland, assignors to Societe Anonyme Automobiles Citroen, France

Continuation of Ser. No. 275,182, July 26, 1972, abandoned. This application Sept. 5, 1974, Ser. No. 503,283

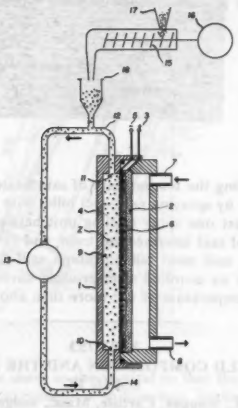
Claims priority, application Switzerland, Aug., 1971, 11361/71

Int. Cl.³ H01M 8/06

U.S. Cl. 429—15 **8 Claims**

1. In an energy conversion process providing electrical discharge by electrochemical oxidation of a particulate anode-active metal in at least one electrochemical cell containing an electrolyte solution capable of dissolving the products of said oxidation, the improvements consisting of:

a. removing from said cell electrolyte solution containing dissolved products of said oxidation resulting from discharge and adding to said solution a high mass-capacity metal which is dissolved therein so as to thereby chemically displace and precipitate said anode-active metal by reducing the said electrochemical oxidation products dissolved in the electrolye solution, so as to thereby recover said anode-active metal in the form of particles in suspension in the electrolyte solution;



b. recycling the recovered anode-active metal particles in suspension in said electrolyte solution whereby to provide discharge with renewed oxidation of said recovered metal in said cell: and

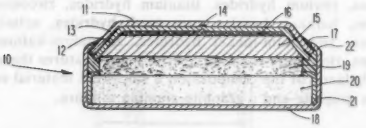
c. repeating said steps (a) and (b) so as to provide electrical discharge in said cell due to repeated recovery and renewed oxidation of said anode-active metal, with consumption of said high mass-capacity metal which is added to the electrolyte solution and dissolved therein outside said cell.

3,981,748

NON-AQUEOUS, PRIMARY BATTERY HAVING A BLENDED CATHODE ACTIVE MATERIAL

Nehemiah Margalit, Levittown, Pa., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Aug. 14, 1975, Ser. No. 604,888
Int. Cl.² H01M *6/00*
U.S. Cl. 429—164 **16 Claims**



1. A non-aqueous, primary battery having a light metal anode selected from the group consisting of lithium, magnesium, aluminum, beryllium, calcium, sodium, and potassium, an electrolytic solution consisting essentially of an organic solvent containing a light metal inorganic salt dissolved therein, a separator, and a blended cathode mix comprising a blend of silver chromate and a metallic phosphate having a discharge potential in the electroytic solution higher than silver chromate and capable or reacting with silver ions present in the cathode mix to form silver phosphate, and said battery being characterized by having a single silver voltage plateau throughout discharge.

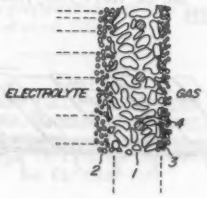
9. A non-aqueous, primary battery of a button cell construction having a light metal anode selected from the group consisting of lithium, magnesium, aluminum, beryllium, calcium, sodium, and potassium, an electrolytic solution consisting essentially of an organic solvent containing a light metal inorganic salt dissolved therein, a separator, and a blended cathode mix comprising a blend of silver chromate and a metallic phosphate having a discharge potential in the electrolytic solution higher than silver chromate and capable of reacting with silver ions present in the cathode mix to form silver phosphate, said cathode mix containing at least about 50% by weight of silver chromate, and said battery being characterized by having a single silver voltage plateau throughout discharge.

3,981,749

GAS DIFFUSION ELECTRODE FOR A BATTERY

Masataro Fukuda, Takatsuki; Tsutomu Iwaki, Kyoto, and Hiroshi Kawano, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 174,137, Aug. 23, 1971, abandoned, which is a continuation of Ser. No. 686,043, Nov. 28, 1967, abandoned. This application Sept. 12, 1973, Ser. No. 396,558
Claims priority, application Japan, Nov. 30, 1966, 41-79022
Int. Cl. H01m *13/00*
U.S. Cl. 429—41 **6 Claims**



1. A battery comprising:

a gas diffusion electrode, said electrode comprising:

a high porosity sintered metallic body, said body having nickel as its main constituent,

a first layer affixed to one side of said sintered body, said first layer consisting essentially of: a powder-like, alkali-resistive material which is catalytically inert with respect to fuel, and a synthetic resin binder agent;

an electrolyte in contact with said first layer of said gas diffusion electrode; and

means for supplying a gas on the other side of the sintered body of said gas diffusion electrode.

3,981,750

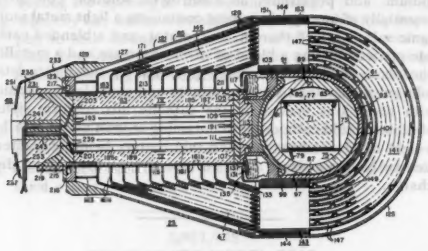
ELECTRICAL GENERATOR

David L. Purdy, Indiana, Pa., assignor to Coratomic Inc., Indiana, Pa.

Filed July 12, 1973, Ser. No. 378,513
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.² G21H *1/10*
U.S. Cl. 136—202 **22 Claims**

1. An electrical generator including a container, a heat source and a thermoelectric unit of the solid-state type having a hot-junction and a cold-junction within said container,

means within said container, contacting substantially the whole outer surface of said unit, for applying stress of the



hydrostatic type to said unit, and means connecting said hot-junction in heat-deriving relationship with said source.

3,981,751

THERMOELEMENT AND THERMOPILE BASED THEREON

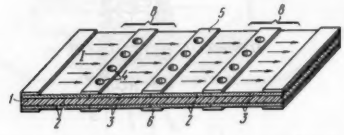
Zinovy Moiseevich Dashevsky, ulitsa Marxa-Engelsa, 15, kv. 52; Yakov Alexandrovich Kaller, ulitsa Kominterna, 11/7, kv. 20; Nikolai Vasilievich Kolomoets, ulitsa Kastanaevskaya, 61, kv. 22, and Igor Vladimirovich Sgibnev, Frunzensky val, 38, kv. 6, all of Moscow, U.S.S.R.

Filed Dec. 3, 1974, Ser. No. 529,234

Claims priority, application U.S.S.R., Dec. 6, 1973, 1975107

Int. Cl.² H01V *1/02, 1/04*

U.S. Cl. 136—225 **2 Claims**



1. A thermoelement comprising: a substrate; an n-type branch formed by two semiconductor n-type films applied one opposite the other onto the opposite side of one portion of said substrate; a p-type branch formed by two semiconductor p-type films applied one opposite the other onto the opposite sides of another portion of said substrate; a row of through holes provided in said substrate between said n- and p-type branches; commutation buses for interconnecting said branches, there being one bus on both sides of said row of holes, said buses being electrically interconnected through said holes.

3,981,752

METHOD FOR CONTROLLING THE TEMPERATURE OF STEEL DURING HOT-ROLLING ON A CONTINUOUS HOT-ROLLING MILL

Helmut Kranenberg, Orchard Park, N.Y., and Richard S. Hostetter, Jr., Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation of Ser. No. 416,309, Nov. 15, 1973, abandoned. This application Dec. 10, 1974, Ser. No. 531,272

Int. Cl.² C21D *7/14*

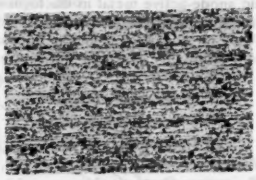
U.S. Cl. 148—12 B **11 Claims**

1. A method for producing an as-rolled steel product taken from the group consisting of a bar and rod from a steel billet in a continuous hot rolling mill having a plurality of roll stands in a roughing train, an intermediate train and a finishing train wherein said steel billet is progressively reduced in cross-sectional area, comprising:

a. heating said steel billet to a temperature of about 1950° F. to about 2100° F.,

b. passing said heated steel billet through said roughing train to effect a first reduction in cross-sectional area,

c. passing said heated steel billet through said intermediate train,



d. controlling the temperature of said heated steel billet in step (c) by spraying said steel billet with a liquid coolant in at least one spray cooling unit between selected roll stands of said intermediate train, and

e. passing said steel billet through said finishing train to produce an as-rolled steel product having an integrated mean temperature of not more than about 1750° F.

3,981,753

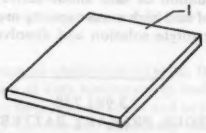
STOP-WELD COMPOSITION AND THE METHOD OF USING IT

William H. L. Hopper, Carlisle, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Division of Ser. No. 725,480, April 30, 1968, abandoned. This application June 26, 1970, Ser. No. 59,859

Int. Cl.² B23K *35/34*

U.S. Cl. 148—23 **1 Claim**



1. A stop-weld composition for pressure inflating internal cavities in sheet metal at elevated temperatures containing from about 1 to 50% by weight of a metal hydride selected from aluminum hydrides, sodium hydrides, potassium hydrides, calcium hydrides, strontium hydrides, barium hydrides, yttrium hydrides, titanium hydrides, zirconium hydrides, hafnium hyrides, rare earth hydrides, actinide hydrides, zirconium-nickel hydrides, zirconium-hafnium hydrides, zirconium-titanium hydrides and mixtures thereof and the balance of the composition a stop-weld material selected from graphite and a graphite-alumina mixture.

3,981,754

METHOD FOR HEATING SHEET METAL

John Erixson, Vasteras, Sweden, assignor to Granges Engineering AB, Vasteras, Sweden

Continuation-in-part of Ser. No. 309,594, Nov. 24, 1972, abandoned. This application July 3, 1975, Ser. No. 593,161

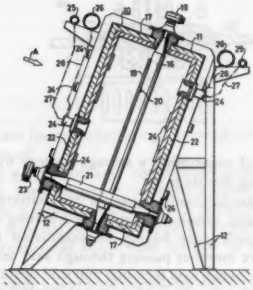
Claims priority, application Sweden, Nov. 30, 1971, 15294/71

Int. Cl.² C21D *9/46*

U.S. Cl. 148—155 **4 Claims**

1. A method of counteracting or preventing formation and agglomeration of scale and other foreign material on the roller surfaces of a roller path for supporting one flat side of a heavy

steel sheet during heat treatment of said sheet in a furnace, comprising the steps of: transporting the steel sheet endwise in a substantially horizontal direction in said furnace; disposing and supporting said one flat side of the sheet by said roller path in a plane inclined with respect to the vertical and transverse to the furnace, during the entire heat treatment, to sustain only part of the weight of the inclined sheet; supporting the inclined sheet along the lower edge thereof by further sheet-supporting means, substantially at right angles to the roller path, during the entire heat treatment, to sustain the rest of the weight of the inclined sheet; selecting the angle of



inclination of the sheet to the vertical so that the actual steel sheet thickness, expressed in millimeters, multiplied by the sine value of said angle of inclination is at most 12 to 15 millimeters to thereby restrict the pressure exerted by the inclined sheet perpendicularly against the rollers of the roller path to a value insufficient to cause the agglomeration of scale on said one flat side of the sheet and said rollers; and applying simultaneously with the described steps a heat treatment to the inclined steel sheet by exposing both said one flat side and the opposite flat side of the sheet between the rollers of the roller path to heat, to shorten the stay time of the sheet in the furnace.

3,981,755
PHOTOCATHODE MANUFACTURE

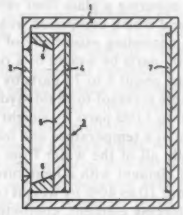
Jonathan Paul Gowers, Salfords near Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 418,295, Nov. 23, 1973, Pat. No. 3,889,143. This application Dec. 19, 1974, Ser. No. 534,205

Claims priority, application United Kingdom, Aug. 21, 1973, 54387/73

Int. Cl.² H01L 7/36, 7/38

U.S. Cl. 148—171 **5 Claims**



1. A method of manufacturing a photocathode which includes a single-crystal layer of photocathode material the thickness of which is of the order of the diffusion length of electrons therein, said method comprising the steps of:

a. growing a single crystal layer of gallium indium phosphide by an epitaxial technique on a single crystal substrate of gallium arsenide, said crystal layer having relative proportions of gallium and indium such that the lattice parameter thereof is substantially the same as that of said substrate,

b. subsequently growing said layer of photocathode material of doped gallium arsenide by an epitaxial technique on the free surface of the gallium indium phosphide layer so that said photocathode material layer has a lattice parameter substantially the same as said single-crystal layer, and

c. subsequently removing at least part of said substrate to expose the gallium indium phosphide.

3,981,756
PROCESS FOR PREPARING HIGH DENSITY SOLID PROPELLANTS

Carl Gotzmer, Jr., La Plata, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 9, 1975, Ser. No. 611,772

Int. Cl.² C06B 45/10, 21/00

U.S. Cl. 149—19.3 **12 Claims**

1. A process for preparing a high density solid propellant which comprises mixing the solid propellant components which comprise a high molecular weight perfluorinated polymer binder and an inorganic oxidizer salt with a dispersion comprising a dissolved low molecular weight perfluorinated polymer, a suspended low molecular weight perfluorinated polymer and a suitable solvent; removing the solvent; and drying the resulting solids.

12. A high density solid propellant consisting essentially of 25 to 70% of NF_4BF_4, 5 to 50% of a polytetrafluoroethylene having an average molecular weight of about 3 million and 10 to 25 percent of a polytetrafluoroethylene having an average molecular weight of about 3700.

3,981,757
METHOD OF FABRICATING KEYBOARD APPARATUS

Willis August Larson, Mequon, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Apr. 14, 1975, Ser. No. 567,874

Int. Cl.² C23F 1/02

U.S. Cl. 156—8 **23 Claims**

1. Method of forming electrode means having a height differential on an insulator to form a touch sensitive electronic switch including: an insulator having a first face; a plurality of first electrode means supported on the first face of the insulator and having a top surface; a plurality of second electrode means supported on the first face of the insulator and having a top surface, with the height of the top surface of the plurality of first electrode means being vertically spaced from the height of the top surface of the plurality of second electrode means, with the plurality of first electrode means being electrically insulated from the plurality of second electrode means, and with plurality of first electrode means and the plurality of second electrode means forming an array of individual switching units for use in a touch sensitive electronic keyboard switch, said method comprising:

a. obtaining an insulator having a first face with at least the first face supporting a conductive layer;

b. forming a pattern of first electrode means in the entire thickness of the conductive layer including apertures therethrough which expose the first face of the insulator; and

c. forming a pattern of second electrode means of a thickness unequal to the thickness of the conductive layer on the first face of the insulator within and spaced from at

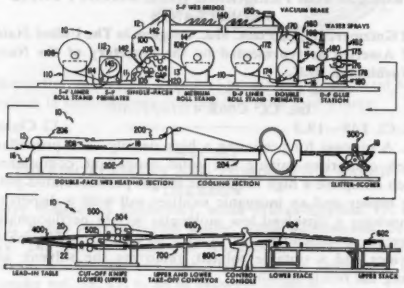
least one of the apertures exposing the first face of the insulator.

3,981,758

PROCESS CONTROL SYSTEM FOR CORRUGATORS

William Stansbury Thayer, Lutherville, and Charles Edward Thomas, Reisterstown, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Nov. 4, 1974, Ser. No. 520,687
Int. Cl.² B32B 31/00
U.S. Cl. 156—64 54 Claims



1. A method of improving the quality of blanks being made from a double-face corrugated paperboard web issuing from a corrugator machine comprising the steps of:

automatically maintaining substantially constant the heating time of succeeding portions of said double-face web advancing through said corrugator machine to apply a substantially constant amount of heat to said succeeding portions of said double-face web;

automatically maintaining substantially constant the amount of heat applied to succeeding portions of a single-face web forming a first lamina of said double-face web;

automatically maintaining substantially constant the amount of heat applied to succeeding portions of a double-face liner forming a second lamina of said double-face web;

automatically maintaining substantially constant the amount of moisture applied to succeeding portions of said single-face web; and

automatically maintaining substantially constant the amount of moisture applied to succeeding portions of said double-face liner

throughout the range of operating speeds of said corrugator machine.

36. Apparatus for improving the quality of blanks made from a double-face corrugated paperboard web issuing from a corrugator machine, said machine including in combination:

first heating means for heating said double-face web for a substantially constant time;

second heating means for applying a substantially constant amount of heat to a single-face web and to a double-face liner forming said double-face web;

moisture means for applying a substantially constant amount of moisture to said single-face web and said double-face liner; and

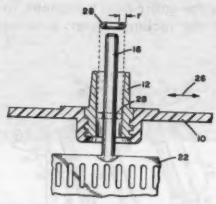
control means responsive to the speed of said corrugator machine for controlling said first heating means, said second heating means, and said moisture means to automatically maintain said heating time, said amount of heat, and said amount of moisture substantially constant throughout the range of operating speeds of said corrugator machine.

3,981,759

METHOD OF ASSEMBLING A STORAGE BATTERY USING VIBRATORY ENERGY

Arthur M. Summo, Danbury, Conn., assignor to Branson Ultrasonics Corporation, New Canaan, Conn.

Filed Nov. 17, 1975, Ser. No. 632,240
Int. Cl.² B29C 27/08
U.S. Cl. 156—73.5 6 Claims



1. A method of assembling a storage battery by frictional energy comprising the steps of:

disposing a thermoplastic cover of the battery having a hollow metallic terminal therein upon mating surfaces of a thermoplastic case having an associated upstanding metallic core member passing through said terminal, the clearance between said terminal and said upstanding core member in the direction of motional displacement being at least equal to the motional displacement between said cover and said case when frictional energy is applied;

applying a static force between said cover and said case in a direction substantially perpendicular to the plane of the mating surfaces between said cover and said case while causing said cover and said case to undergo relative reciprocating translating motion in a direction substantially parallel to the plane of the mating surfaces for causing softened thermoplastic material at the mating surfaces;

stopping the translating motion while maintaining said static force for causing the softened material to rigidify whereby to provide a fused joint between said cover and said case, and

sealing the gap between said terminal and said core.

3,981,760

ADHESION OF GLASS FIBERS TO RUBBER WITH ADHESIVE LAYER COMPRISING A CRESOL-FORMALDEHYDE-RESORCINOL RESIN

Otto C. Elmer, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

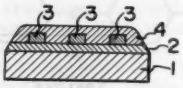
Division of Ser. No. 523,645, Nov. 13, 1974, Pat. No. 3,955,033. This application Jan. 12, 1976, Ser. No. 648,440
Int. Cl.² B29H 5/02, 9/02, 9/04; C03C 25/02
U.S. Cl. 156—110 A 6 Claims

1. A method for adhering a glass fiber reinforcing element to a rubber compound which comprised treating said element with a composition consisting essentially of an aqueous alkaline dispersion of 100 parts by weight of a rubbery vinyl pyridine copolymer, from about 8 to 75 parts by weight of a water soluble, heat reactable o-cresol-formaldehyderesorcinol resin, and from about 250 to 1100 parts by weight of water, heating said treated element at a temperature and for a time sufficient to remove essentially all of the water from said composition and to provide said element with a heat cured adhesive in an amount of from about 10 to 40% by weight (dry) based on the weight of said reinforcing element, combining said dried and heat cured adhesive containing reinforcing element with an unvulcanized vulcanizable rubber compound, and vulcanizing the same, the mol ratio of the o-cresol to the resorcinol being from about 1:1 to 1:5 and the mols of formaldehyde being in excess of the total mols of the o-cresol and resorcinol in the resin, and said composition coating and at least substantially totally impregnating said element.

3,981,761
PROCESS FOR MANUFACTURING PRINTED SUBSTRATES AND DECALCOMANIA COMPOSITIONS USED THEREFOR

Yasuhiro Kojima, Inazawa; Niiti Matunaga, Yokkaichi, and Motoki Nawa, Toyoake, all of Japan, assignors to Nippon Toki Kabushiki Kaisha, Nagoya, Japan

Filed Aug. 27, 1973, Ser. No. 392,001
Claims priority, application Japan, Sept. 11, 1972, 47-91119
Int. Cl.² B32B 7/04
U.S. Cl. 156—235 8 Claims



1. A process for manufacturing a printed substrate comprising the steps of:

providing a decalcomania composition consisting of a permeable backing paper, a water-soluble binder coated thereon, a printed electric circuit pattern made of a conductor material or resistor material formed on the binder, and a removable cover coat formed on the printed pattern,

the removable cover coat consisting essentially of a member selected from the group of (1) silicone rubber, (2) a plastic film containing silicon rubber and (3) a film-forming coating material containing silicon rubber,

immersing said decalcomania composition in water to separate the paper from said printed conductor or resistor material-made pattern attached to the cover coat,

applying said printed pattern which is attached to the cover coat directly onto a flat or non-flat substrate substantially without any material between said printed pattern and said substrate, said substrate being of low porosity selected from the group consisting of alumina or fosterite,

peeling said cover coat off said printed pattern applied to the substrate, and

baking the printed pattern-applied substrate to obtain a conductor or resistor material pattern printed substrate, whereby the conductor or resistor pattern is baked substantially free of any material thereon which would have a deleterious effect on the performance of the resulting printed electric circuit.

5. A process for manufacturing an electric circuit printed substrate comprising the steps of:

providing a decalcomania composition consisting of a permeable backing paper, a water-soluble binder coated thereon, a removable cover coat formed on the water-soluble binder and a printed electric circuit pattern made of a conductor material or a resistor material and formed on the removable cover coat,

the removable cover coat consisting essentially of a member selected from the group of (1) silicone rubber, (2) a plastic film containing silicone rubber and (3) a film-forming coating material containing silicone rubber,

immersing said decalcomania composition in water to separate the paper from said cover coat to which said printed, conductor or resistor material-made pattern is attached,

applying said printed pattern which is attached to said cover coat directly onto a flat or non-flat substrate substantially without any material between said printed pattern and said substrate, said substrate being of low porosity selected from the group consisting of alumina or fosterite,

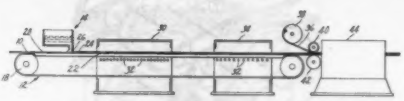
peeling said cover coat off said printed pattern applied to the substrate, and

baking the printed pattern-applied substrate to obtain a conductor or resistor material pattern printed substrate, whereby the conductor or resistor pattern is baked substantially free of any material thereon which would have a deleterious effect on the performance of the resulting printed electric circuit.

3,981,762
METHOD FOR BONDING RESIN FILM TO METAL

Howard G. Davis, Wellesley; Emerson B. Hovey, Wayland, and Edwin E. Sylvester, Danvers, all of Mass., assignors to USM Corporation, Boston, Mass.

Filed Aug. 3, 1972, Ser. No. 278,173
Int. Cl.² B65C 9/25; C09J 3/14
U.S. Cl. 156—322 8 Claims



1. The method of bonding a resin film having a thickness of less than 10 mils and having one surface formed with a three-dimensional pattern to a surface of a metal workpiece comprising the steps of coating a surface of the metal workpiece with a heat-curing adhesive solution in a volatile organic solvent of from about 35 to 55 parts by weight of an —NCO terminated prepolymer from reaction of an excess of a polyfunctional isocyanate with at least one —OH terminated polyester or copolyester, from about 5 to about 15 parts by weight of a terpolymer of vinyl chloride, vinyl acetate and maleic anhydride, up to about 10 parts by weight of chlorinated rubber and from about 10 to about 25 parts by weight of a mineral filler, heating said workpiece to a temperature of at least about 400°F. in a period of about 50 seconds and for a time to drive off said solvent and bring said adhesive to an intermediate state of cure having increased firmness but in which it retains thermoplasticity needed to give tackiness and ability to enter into wetting adhesive engagement with said resin film at the temperature of assembly with said resin film, reducing the temperature of said workpiece to a temperature in the range of from about 290°F. to about 325°F. which is below that which will rapidly soften and distort resin film but which will keep said coating tacky for wetting adhesive engagement with said resin film, laying down said resin film on the tacky adhesive coating, passing said assembly between the nip of rolls to apply momentary pressure to join said resin film to said metal workpiece and directly quenching the assembly of metal workpiece and resin film to below the distortion point of said resin film.

3,981,763
APPARATUS FOR THE MANUFACTURE OF DISPOSABLE DIAPERS OR OTHER ARTICLES HAVING STOP MOTION DEVICES THEREIN

Charles E. Brocklehurst, Honea Path, S.C., assignor to Riegel Textile Corporation, New York, N.Y.

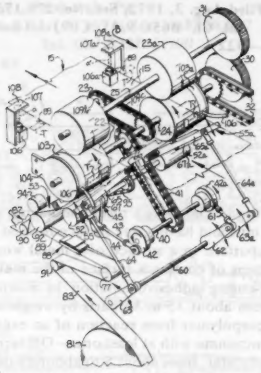
Division of Ser. No. 385,832, Aug. 6, 1973, abandoned. This application Feb. 11, 1975, Ser. No. 549,049
Int. Cl.² B65C 9/40
U.S. Cl. 156—352 7 Claims

1. In an apparatus for the manufacture of disposable diapers or other articles having spaced apart fastener tabs, labels or strips at predetermined locations thereon and including means for continuously moving material being manufactured into such articles through said apparatus, and means for applying such fastener tabs, labels or strips at the predetermined locations to the moving material; the combination therewith of:

electrically operated drive means operatively connected with said material moving means and said tab, label or strip applying means for driving both of said means;

sensing means positioned adjacent said tab, label or strip applying means and downstream of the path of travel of the material therefrom for sensing the passage of the tabs, labels or strips applied on the moving material; and

electric circuit means connected with said sensing means and with said drive means for normally operating said drive means and being responsive to said sensing means for stopping operation of said drive means when said sensing means fails to sense the passage of a tab, label or strip at a predetermined location on the moving material as it passes said sensing means,



whereby operation of said material moving means and said tab, label or strip applying means is stopped in the event of the failure of a tab, label or strip having been applied to the moving material at a predetermined location for repair of said apparatus.

3,981,764

III-V COMPOUND SEMI-CONDUCTOR CRYSTAL GROWTH FROM A LIQUID PHASE ON A SUBSTRACT INCLUDING FILTERING LIQUID PHASE

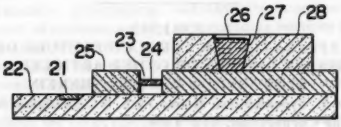
Kazuhiro Ito, Tokyo; Masao Kawamura, Fuchu; Yuichi Ono, and Makoto Morioka, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed June 25, 1975, Ser. No. 590,336

Claims priority, application Japan, Aug. 12, 1974, 49-91553

Int. Cl.² B01J *17/20*; **C01B** *19/00*, *27/00*; **C01F** *7/00*

U.S. Cl. 156—622 **6 Claims**



1. A method for crystal growth, in which a semiconductor crystal is grown in a liquid phase on a substrate crystal, which comprises:

1. preparing a solution for crystal growth comprising a III–V compound semiconductor material containing a predetermined amount of solute which is to be grown,
2. heating said solution to a temperature which is higher than the temperature of crystal growth,
3. cooling said solution to said temperature of crystal growth, whereby a part of said solute crystallizes out as small crystals,
4. separating said solution for crystal growth into two parts, one of which contains said crystals and the other of which does not by initially placing said solution in a first well, by positioning said first well over a second well having filter means through which only liquid can pass adjacent to its upper portion and by allowing said crystals to form in the solution while it is contained in said first well and thereafter allowing liquid in the solution to pass through said filter means into the second well,
5. bringing said substrate crystal into contact with the part of said solution for crystal growth containing no crystals in said second well and
6. forming a temperature gradient, at the latest before said step of bringing said substrate crystal into contact with the part of said solution for crystal growth containing no crystals, whereby the temperature increases in an upward direction from the substrate crystal to the upper surface of the solution for crystal growth.

3,981,765

TREATMENT OF WOOD CHIPS WITH AN ALKALI METAL BOROHYDRIDE SOLUTION FOLLOWED BY MECHANICAL DEFIBRATION

Emilio Kruger, Milan; Guglielmo Ruffini, Lovere (Bergamo); Giovanni Gandini, and Franco Ghislandi, both of Milan, all of Italy, assignors to Vita Mayer & C., Milan, Italy

Continuation-in-part of Ser. No. 518,816, Oct. 29, 1974, abandoned, which is a continuation of Ser. No. 403,421, Oct. 4, 1973, abandoned, which is a continuation of Ser. No. 279,318, Aug. 10, 1972, abandoned, which is a continuation of Ser. No. 872,749, Oct. 30, 1969, abandoned. This application Dec. 17, 1974, Ser. No. 533,638

Claims priority, application Italy, July 30, 1969, 20285/69; Sept. 26, 1969, 22550/69

Int. Cl.² D21C *3/02*, *3/12*

U.S. Cl. 162—80 **5 Claims**

1. A chemi-mechanical process for making an unbleached pulp with yield of at least 85% and brightness in excess of 60 G.E. with good color stability and high strength characteristics for papermaking purposes, the steps comprising in sequence:

a. providing a lignocellulosic material in the form of wood chips having a thickness in the range between 1/16 and ⅛ inch, and a dryness between 50 to 90%,
b. impregnating the chips at a temperature from room temperature to 50°C with an alkaline solution comprised of an aqueous solution of sodium hydroxide and an alkali metal borohydride in an amount from 0.1 to 2.0% by weight of the chips and with a ratio of solution to chips of 2:1 to 20:1, said alkaline solution having an alkalinity, based on the Na_2O content of the alkaline material, from 3.5% to not in excess of 16%, by weight, and having a pH in excess of 13,
c. heating the alkaline borohydride-impregenated chips at a temperature not greater than 150°C for at time between 15 minutes to 30 minutes to provide semi-cooked chips,
d. separating said semi-cooked chips from the solution, and
e. defiberizing the separated semi-cooked chips to mechanically separate the fibers of the chips into an unbleached pulp having said brightness, yield, and strength characteristics.

3,981,766

METHOD OF CONTROLLING FUNGI AND BACTERIA IN PAPER PRODUCTS

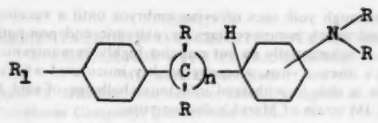
Engelbert Pechhold, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 21, 1975, Ser. No. 551,961

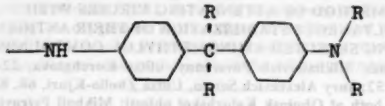
Int. Cl.² D21D *3/00*; **D21H** *5/22*

U.S. Cl. 162—161 **9 Claims**

1. A method of controlling bacteria or fungi comprising applying to the locus to be protected a biocidally effective amount of a substituted cyclohexylamine of the formula:



where R is hydrogen or methyl,
R_1 is hydrogen or



n is 0 or 1 and the halogen, sulfate, nitrate or acetate salt thereof.

3,981,767

APPARATUS AND METHOD FOR CONTROLLING THE STOCK FLOW TO A PAPER MACHINE HEADBOX

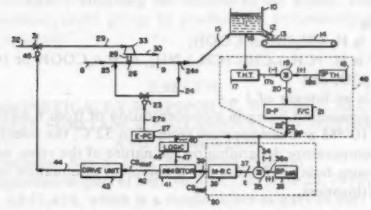
Abdul-Rahman A. Al-Shaikh, Mount Kisco, N.Y., assignor to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 888,431, Dec. 29, 1969, abandoned. This application June 4, 1971, Ser. No. 150,142

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² D21F *1/06, 1/08*

U.S. Cl. 162—198 **34 Claims**



1. In a paper machine headbox system including a headbox, a stock pump, a main stock line from said stock pump which branches into a by-pass line which shunts said main stock line and a headbox stock flow line through which stock may flow from said main stock line to said headbox, an apparatus for controlling the stock flow rate in said headbox stock flow line which comprises:

a. first means for providing by-pass flow control signals related to a desired headbox stock flow rate;

b. a by-pass flow control valve in said by-pass line and responsive to said by-pass flow control signals;

c. second means for providing main stock flow control signals;

d. third means, responsive to said main stock flow control signals, for controlling the stock flow rate in said main stock flow line; and

e. logic-inhibit means, logically responsive to said by-pass flow control signals, for inhibiting said third means response to said main stock flow control signals until said by-pass flow control valve exceeds predetermined limits.

3,981,768

WEB-FORMING METHOD AND APPARATUS FOR PAPER-MANUFACTURING MACHINES

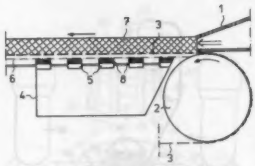
Antti Lehtinen, Jyvaskyla, Finland, assignor to Valmet Oy, Finland

Filed Dec. 3, 1974, Ser. No. 529,112

Claims priority, application Finland, Dec. 5, 1973, 3751/73

Int. Cl.² D21F *1/32*

U.S. Cl. 162—199 **8 Claims**



1. In a paper manufacturing method, the steps of situating stock which issues from a headbox against one side of a travelling wire to form a web at said one side of said wire and a film of liquid at said wire, and simultaneously directing a plurality of small jets of steam toward the opposite side of the wire, which is opposed to said one side thereof, from a location which is in close proximity to said opposite side of said wire, in a manner creating in said film small steam bubbles which implode to provide an implosion action at said opposite side of the wire, in the wire, and in the web which forms at said one side of the wire.

4. In a paper manufacturing machine, travelling wire means for forming on one side of said wire means from stock delivered from a headbox to said one side of said wire means, a web and a film of liquid situated at said wire means, and means at the opposite side of said wire means, in close proximity thereto, for directing jets of steam toward said opposite side of said wire means in a manner creating in said film of liquid small steam bubbles which due to the lesser temperature of the film of liquid, as compared with the temperature of the steam bubbles, implode to subject the web and wire means to implosion action.

3,981,769

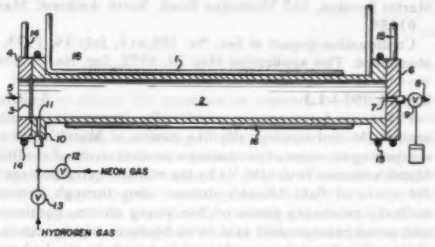
PROCESS FOR PREPARING FLUORINE-18

Harry S. Winchell, Lafayette; Dale K. Wells, Martinez; James F. Lamb, Albany, and Samuel B. Beaudry, Walnut Creek, all of Calif., assignors to Medi-Physics, Inc., Emeryville, Calif.

Continuation-in-part of Ser. No. 247,588, April 26, 1972, abandoned. This application Aug. 29, 1974, Ser. No. 501,557

Int. Cl.² G21G *1/00*

U.S. Cl. 176—11 **7 Claims**

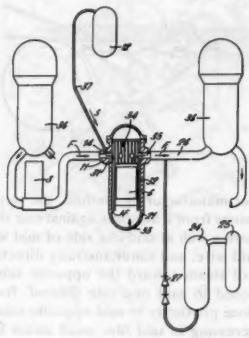


1. A process for making fluorine-18 comprising: irradiating neon-20 gas molecules in an enclosed reaction zone with energetic deuteron particles to form fluorine-18; heating said reaction zone to a temperature in excess of 500°C.; and flushing the heated fluorine-18 from said reaction zone with an inert gas.

3,981,770
PROTECTIVE ARRANGEMENTS FOR COOLING SYSTEMS

John Ernest Middleton, Great Glen, England, assignor to Nuclear Power Company (Whetstone) Limited, England

Filed Apr. 24, 1974, Ser. No. 463,778
Claims priority, application United Kingdom, Apr. 25, 1973, 19599/73
Int. Cl.² G21C *19/40*
U.S. Cl. 176—37 **19 Claims**



1. An emergency protective arrangement for a cooling system of a kind in which a fluid coolant consisting of a liquid, a gas, a vapor or a two-phase fluid is circulated around the system under pressure through a coolant path including a region to be protected against overheating, the protective arrangement comprising:

a. means sensing a condition of the coolant feeding said region,

b. means controlled by said sensing means to inject into the system an auxiliary fluid coolant under pressure following a reduction in the normally circulating coolant feeding said region, which may be due, for example, to a breach in a part of the system upstream from said region, and

c. nozzle means through which the auxiliary fluid is injected into said coolant path,

d. said nozzle means being arranged to maintain a flow of coolant in a normal direction through said region and to prevent cessation or reversal of flow through said region for a period of time following said reduction to permit other protective arrangements to become effective.

3,981,771
MAREK'S DISEASE VACCINE

Martin Sevoian, 167 Montague Road, North Amherst, Mass. 01059

Continuation-in-part of Ser. No. 380,615, July 19, 1973, abandoned. This application May 29, 1975, Ser. No. 581,967
Int. Cl.² A61K *39/32*
U.S. Cl. 195—1.3 **5 Claims**

1. Process for preparing vaccine for immunizing poultry against JM and serologically like strains of Marek's disease comprising the steps of producing a virulent strain of modified Marek's disease virus (JM-V) by the multiple serial passage of JM strain of field Marek's disease virus through humoral antibody producing tissue of live young chicks, continuing said serial passage until said virus becomes highly immunogenic and pathogenic as evidenced by lymphoblastic leukemia and mortality of birds within ten days postinoculation, the immunogenicity of said modified virus (JM-V) being evidenced by development in chickens inoculated with the modified virus of antibody levels in the range of 10–350 serum neutralization titers per milliliter, and thereafter attenuating the pathogenicity of said modified virus by serially passing the same through yolk sacs of avian embryos until a vaccine is obtained which is non-contagious, aviremic and non-pathogenic or substantially so but remains highly immunigenic to Marek's disease virus, whereby poultry inoculated with said vaccine is able to withstand infectous challenge of said JM-V and JM strain of Marek's disease virus.

3,981,772
METHOD OF ATTENUATING VIRUSES WITH SIMULTANEOUS STABILIZATION OF THEIR ANTIGENS USING SELECTED AMINOMETHYLOL COMPOUNDS

Alexandr Mikhailovich Poverenny, ulitsa Kurchatova, 22-a, kv. 52; Jury Alexeevich Semin, Ulitsa Zholio-Kjuri, 60, Kv. 41, both of Obninsk Kaluzhskoi oblasti; Mikhail Petrovich Chumakov, Leninsky prospekt, 68/10, kv. 354, Moskow; Antonina Vasilievna Gagarina, poselok Instituta poliomielita, 3, kv. 30; Maria Kronidovna Khanina, poselok Instituta poliomielita, 3, kv. 16, both of Moskovskaya oblast; Evgeny Alexandrovich Tkachenko, ulitsa Yablochkova, 23, kv. 216, and Vyacheslav Nikolaevich Bashkirtsev, ulitsa arkhitektora Vlasova, 33, korpus 1, kv. 23, both of Moscow, all of U.S.S.R.

Filed July 17, 1975, Ser. No. 596,909
Claims priority, application U.S.S.R., Aug. 27, 1974, 2055851
Int. Cl.² C12K *7/00*
U.S. Cl. 195—1.4 **2 Claims**

1. A method of attenuating the infectiousness of viruses with a simultaneous stabilization of their antigens which consists of attenuating a liquid virus-containing material with an aminomethylol derivative having the formula:

$$R'-\underset{\displaystyle R^2}{\overset{\displaystyle |}{C}}H-NHCH_2OH$$

where:

R′ is H, CH_2OH or COOH;

R^2 is H, $(CH_2)_2CH_3$, $(CH_2)_nNH_2$, $(CH_2)_nCOOH$ or $(CH_2)_nOH$; and

N is an integer of 1 – 4

said compound being in a concentration of from 6.6×10^{-3} to 1.6×10^{-3}M at a temperature from 4° to 32°C, the selection of the temperature depending on the nature of the virus, and the exposure being sufficient for a complete attenuation of viral infectiousness.

3,981,773
PROCESS FOR THE PREPARATION OF GALACTOSE AND BEVERAGES BASED ON GALACTOSE FROM SOLUTIONS CONTAINING LACTOSE

Pierre Galzy, and Guy Jean Moulin, both of Montpellier, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed July 18, 1974, Ser. No. 489,736
Claims priority, application France, July 20, 1973, 73.26663; Aug. 3, 1973, 73.28537
Int. Cl.² C12D *13/02*; C12K *1/02*
U.S. Cl. 195—31 R **14 Claims**

1. A process for the preparation of a solution containing galactose from a solution containing lactose comprising:

a. inoculating said solution containing lactose with a culture of a living mutant, non-pathogenic, prototrophic yeast having β-galactosidase and gal⁻ character selected from the group consisting of ascomycetes and basidiomycetes;

b. fermenting said solution to produce a galactose containing solution; and

c. recovering said galactose containing solution.

3,981,774

FERMENTATION OF OXYGENATED HYDROCARBON COMPOUNDS WITH THERMOPHILIC MICROORGANISMS

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 30, 1975, Ser. No. 618,191
Int. Cl.² C12B 1/00; C12D 13/06
U.S. Cl. 195—49 24 Claims

1. A method of producing a single cell protein material which comprises culturing a *Bacillus* microorganism species NRRL B-8066 or NRRL B-8065 in an aqueous medium employing an oxygenated hydrocarbon as carbon and energy source under aerobic fermentation conditions and recovering the resulting microorganisms as a single cell protein material.

3,981,775

ENZYME INSOLUBILIZATION

Robert Sydney Kenyon, 29 Glen St., Eastwood, New South Wales, Australia 2122; John Lyndon Garnett, 29 Arabella St., Longueville, New South Wales, Australia 2066, and Michael James Liddy, 20 Carinyan Crescent, Castle Hill, New South Wales, Australia 2154

Filed Jan. 10, 1975, Ser. No. 540,087
Claims priority, application Australia, Jan. 18, 1974, 6298/74
Int. Cl.² C07G 7/02
U.S. Cl. 195—68 11 Claims

1. A process for insolubilizing an enzyme comprising the steps of:

1. grafting a monomer selected from the group consisting of p-nitrostyrene and p-nitrophenylacrylate onto an inert polymeric carrier using an ionizing radiation at a dose of from 1 to 10 megarads under conditions conducive to surface grafting;
2. converting the nitro-group of the grafted polymeric carrier to an amino, diazo or isothiocyanato group; and
3. covalently attaching the enzyme to the amino, diazo or isothiocyanato group to produce an enzymically active conjugate.

3,981,776

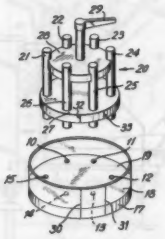
MAGNETICALLY RESPONSIVE, BIOLOGICALLY ACTIVE SUBSTANCE AND ASSOCIATED METHODS AND APPARATUS

Rolf Saxholm, Box 3, 1362 Billingstad, Norway

Continuation-in-part of Ser. No. 156,738, June 25, 1971, Pat. No. 3,843,450, which is a continuation-in-part of Ser. No. 705,539, Feb. 14, 1968, abandoned. This application Aug. 30, 1974, Ser. No. 502,107
Claims priority, application Norway, Feb. 16, 1967, 166874/67
The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.
Int. Cl.² C12K 1/04, 1/10
U.S. Cl. 195—103.5 R 37 Claims

1. An article for carrying out microbiological and similar biochemical examinations, said article comprising a test dose of an antibiotic substance whose reactivity with microorganism of a medium in which the test dose is brought into contact is the subject of investigation, a dry and porous carrier which is free of said test dose and to which said test dose can be added, said carrier being inert to said antibiotic substance, and metallic magnetically responsive means disposed on and supported by said carrier and intact with the carrier as a unitary body for pressing the carrier into substantially uniform contact with the medium under the action of an external magnetic field so that the test dose is brought into contact with said medium, said magnetically responsive means being dimensioned and proportioned relative to said carrier to provide a pre-determined operative contact pressure between the carrier and the medium under the influence of the external magnetic field, the amount of magnetically responsive means being only a very small fraction of that required to achieve the same said contact pressure by its added weight.

17. A method of measuring the relative sensitivity of a microorganism and a biologically active substance, which comprises forming a substrate containing the microorganism; forming an article constituted as a unitary body having incorporated therewith metallic magnetically responsive material;



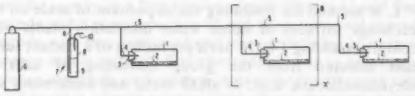
applying a magnetic force to said article in a direction substantially perpendicular to the surface of said substrate to urge the article against the substrate and form good contact therewith, said article being initially porous and dry and free of a biologically active substance, adding said biologically active substance to said article; allowing sufficient time for the biologically active substance to act on the microorganism; and thereafter measuring a sensitivity region surrounding the article.

3,981,777

METHOD AND APPARATUS FOR TESTING MATERIALS FOR LEVELS OF AGENTS INHIBITORY OR TOXIC TO MICROORGANISMS

George Michael Alsop, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 19, 1976, Ser. No. 650,356
Int. Cl.² C12K 1/00
U.S. Cl. 195—103.5 R 11 Claims



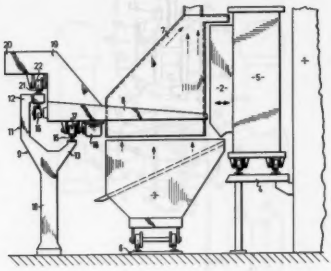
1. Method of testing a material to be subjected to microorganisms to detect the presence or absence of inhibitory or toxic agents capable of inhibiting or preventing growth of said microorganisms comprising mixing a sample of said material with a liquid medium containing microorganisms, said medium being capable of supporting growth of said microorganisms; impregnating the resulting liquid mixture into a porous inert support mass capable of permitting oxygen transfer from ambient gas enveloping said mass to said mixture impregnated into it; incubating said mixture impregnated into said mass for a period of time and under conditions sufficient to promote bacterial growth therein in the absence of inhibitory or toxic agents; removing the incubated mixture from said inert support mass and filtering same through an open-pore filter; and observing the degree of turbidity, or lack of it, in the resulting filtrate.

3,981,778

COKE OVEN HOOD APPARATUS

Fritz Schulte, Meerbusch-Buderich; Johann G. Riecker, Ratingen, and Martin Bender, Dusseldorf-Eller, all of Germany, assignors to Hartung, Kuhn & Co. Maschinenfabrik GmbH, Dusseldorf, Germany

Filed Apr. 8, 1975, Ser. No. 566,428
Claims priority, application Germany, Apr. 16, 1974, 2418323
Int. Cl.² C10B 27/00
U.S. Cl. 202—263 9 Claims



1. In association with a coke oven having a carriageway along one side thereof and a quenching car movable along said carriageway, a combination comprising an elongated support structure extending along that side of said carriageway which is remote from the coke oven; a hood for covering the quenching car; and support frame means movable along said support structure and supporting said hood solely on said support structure.

3,981,779

INHIBITION OF SCALE ON SALINE WATER HEAT EXCHANGE SURFACES WITH IMINODIACETIC ACID COMPOUNDS

Jacob Block, Rockville, and Nelson Samuel Marans, Silver Spring, both of Md., assignors to W. R. Grace & Co., Cambridge, Mass.

Division of Ser. No. 312,343, Dec. 5, 1972, abandoned. This application Aug. 1, 1974, Ser. No. 493,959
Int. Cl.² B01D 3/34; C23F 11/00, 14/00
U.S. Cl. 203—7 2 Claims

1. A method for inhibiting the deposition of scale on heat exchange surfaces of saline water distillation plants which comprises adding 1 to 25 parts per million of a chelant surfactant selected from the group consisting of salts, N-oleyiminodiacetic acid, its alkali metal and ammonium salts, N-oleoyliminodiacetic acid and its alkali metal and ammonium salts.

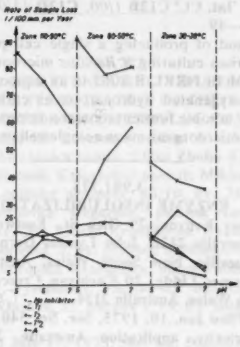
3,981,780

COMPOSITIONS FOR INHIBITING THE CORROSION OF METALS

Claude-Jacques Scherrer, Le Havre; Jean-Louis Mauleon, Sainte Adresse, and Jean-Daniel Gmerek, Bleriot Place, all of France, assignors to Compagnie Francaise de Raffinage, Paris, France and Universal Oil Products Company, Des Plaines, Ill., part interest to each

Division of Ser. No. 353,048, April 20, 1973, Pat. No. 3,907,578. This application Mar. 7, 1975, Ser. No. 556,372
Int. Cl.² C23F 11/12, 11/14
U.S. Cl. 203—7 8 Claims

1. A process for the inhibition of corrosion of metal in a distillation column containing an upper part, an injection port in said upper part, a lower part downstream of said upper part, an injection port in said lower part and a flow of water from said upper part to said lower part, said corrosion due to the contact of said metal with said water containing a chloride ion contaminant which comprises injecting a neutralizing agent through said injection port in said upper part and thereafter injecting an inhibitor composition in said downstream port, said inhibitor composition comprising a mixture of (a) a salt



of a dicarboxylic acid containing from about 10 to about 50 carbon atoms and an aliphatic amine containing from 10 to about 30 carbon atoms, said salt containing an acid to amine ratio of about 1:1 to about 3:1 equivalents of acid per equivalent of amine, and (b) cyclic amine or a mixture of cyclic amines containing 10 or less carbon atoms.

3,981,781

ELECTROLYTICALLY FORMED COMPOSITE COATINGS

Yasunobu Mori, Shizuoka, and Shinjiro Otsuka, Hamamatsu, both of Japan, assignors to Suzuki Motor Company Limited, Japan

Filed Aug. 9, 1974, Ser. No. 496,002
Claims priority, application Japan, Aug. 14, 1973, 48-91069
Int. Cl.² C25D 15/00, 3/12
U.S. Cl. 204—16 19 Claims

1. A method for improving the properties of an electrolytically plated composite layer containing nickel and minute particles codeposited on a substrate comprising the steps of providing a nickel plating electrolyte having a pH of between about 3.5 to 6.0 and containing minute particles, adding to said nickel plating electrolyte a compound containing phosphorous in an amount of between about 0.1 and 4.2 grams per liter, and electrolytically depositing nickel and phosphorous along with said minute particles to produce a composite coating.

3,981,782

ELECTROPLATING OF GOLD AND GOLD COMPOUNDS THEREFOR

Christopher William Bradford, and Harry Middleton, both of London, England, assignors to Johnson Matthey & Co., Limited, London, England

Continuation-in-part of Ser. No. 382,111, July 24, 1973, abandoned. This application Apr. 17, 1975, Ser. No. 568,838
Int. Cl.² C25D 3/48; C01G 7/00
U.S. Cl. 204—46 G 14 Claims

1. A gold compound obtained by reacting an alkali metal gold sulphite with an alkali metal nitrite, said compound having the empirical formula:

$M_4AuNO_2S_2$ where M is an alkali metal.

12. A gold electroplating bath which comprises an aqueous solution of a gold compound according to claim 1 together with an alkali metal nitrite.

14. A gold compound which has an empirical formula corresponding to $Na_4Au(SO_3)_2(NO_2)$. $NaNO_2$. H_2O.

3,981,783

ELECTROCHEMICAL FLUORINATION PROCESS UTILIZING EXCESS CURRENT AND HYDROGEN ADDITION

William V. Childs, and Harold C. Walters, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 23, 1975, Ser. No. 589,738
Int. Cl.[2] C25B 3/08
U.S. Cl. 204—59 F 8 Claims

1. A process for the electrochemical fluorination of a fluorinatable feedstock comprising:

passing an electric current through a current-conducting essentially anhydrous liquid, hydrogen fluoride electrolyte contained in an electrolysis cell containing a cathode and a porous carbon anode;

introducing said feedstock into said anode at a point near a bottom thereof and contacting said feedstock with said electrolyte within pores of said anode to thus at least partially fluorinate at least a portion of said feedstock, said current being passed in an amount sufficient to generate an excess of free fluorine;

introducing hydrogen into said anode at a point near an upper end thereof but below a level of said electrolyte and thus into contact with said free fluorine; and

recovering fluorinated product, unreacted feedstock, and HF.

3,981,784

ELECTROLYSIS PROCESS AND APPARATUS

Gerald F. Pace, Casa Grande, Ariz.; John C. Stauter, Arlington Heights, Ill.; Calvin N. Armstrong, and Gary R. Harris, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Oct. 29, 1974, Ser. No. 518,841
Int. Cl.[2] C25C 1/12, 7/00
U.S. Cl. 204—105 R 9 Claims

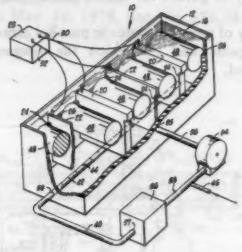
6. A process for electrowinning ions from a liquid electrolyte comprising the steps of:

impressing an electrical potential through said electrolyte by way of electrodes immersed therein;

agitating said electrolyte;

continuously covering said electrolyte with a layer of low conductivity liquid which is immiscible with said electrolyte; and

reducing the area of the interface between said immiscible liquid and said electrolyte to a relatively small area by floating at said interface at least one body member having a density such that said body member floats at the interface between said immiscible liquid and said electrolyte so that agitation of said interface and entrainment of said



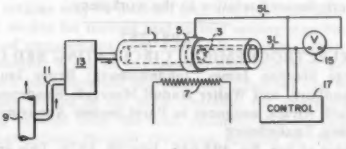
immiscible liquid in said electrolyte is substantially prevented.

3,981,785

ELECTROCHEMICAL SENSOR FOR REACTIVE GAS MIXTURES

Yehuda L. Sandler, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 18, 1969, Ser. No. 843,038
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl. G01n 27/46
U.S. Cl. 204—195 S 8 Claims



1. An electrochemical device for monitoring constituents of an oxygen-fuel mixture comprising, a solid electrolyte electrochemical cell having a first and second electrode disposed on opposite surfaces thereof, said first electrode has a composition exhibiting negligible catalytic action on said mixture, means for supplying a first portion of said mixture to said first electrode and a second portion of said mixture to said second electrode, said first portion of said mixture forming an oxygen reference media and said first electrode serving as an oxygen reference electrode, and catalytic means for equilibrating said second portion of said mixture, said electrochemical device generating an EMF indicative of the difference between the oxygen content of said first portion of said mixture and the equilibrated second portion of said mixture.

3,981,786

ECM AND EDM TOOLING FOR PRODUCING HOLES IN AIRFOIL TRAILING EDGES

Laurance R. Andrews, Agawam, Mass., assignor to United Technologies Corporation, Hartford, Conn.

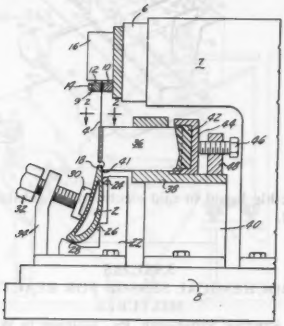
Filed Dec. 19, 1974, Ser. No. 534,314
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976
Int. Cl.[2] C25F 7/00; B23K 9/24
U.S. Cl. 204—224 M 10 Claims

1. A device for supporting a plurality of electrode tubes for drilling a row of holes in a workpiece, said device including:

a base,

a locating fixture for a workpiece,

a plurality of electrodes,
a support for the electrodes movable toward and away from the fixture,
a plurality of guides for the electrodes adjacent to the fixture,
a plurality of movable slides in parallel arrangement, one for each guide and on which the respective guides are mounted,



locating means on each slide having a surface engageable with a portion of the workpiece adjacent to the desired location of the hole therein, and
resilient means acting on each slide in a direction substantially at right angles to the movement of the support for holding it against the workpiece with the electrode properly located relative to the workpiece.

3,981,787

ELECTROCHEMICAL CIRCULATING BED CELL

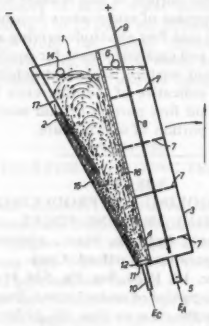
George Stephen James, Johannesburg; Bruce Ian Dewar, Randburg, and Walter Rudolf Moergeli, Roodepoort, all of South Africa, assignors to Parel Societe Anonyme, Luxembourg, Luxembourg

Division of Ser. No. 493,645, July 30, 1974. This application June 27, 1975, Ser. No. 590,862

Claims priority, application South Africa, Aug. 3, 1973, 73/5310; Aug. 3, 1973, 73/5311; Dec. 14, 1973, 73/9490; Dec. 14, 1973, 73/9491; Dec. 14, 1973, 73/9494; May 24, 1974, 74/3330

Int. Cl.² C25B *11/02, 13/02*

U.S. Cl. 204—252 **14 Claims**



1. An electrode system, suitable for use with a counter electrode to perform an electrochemical process in accordance with the invention, which electrode system comprises a particulate electrode, a current conductor, a vessel containing said particulate electrode and current conductor and having an ion-permeable wall at least a part of which is inclined towards the particulate electrode, and means for flowing a fluid medium through said vessel in contact with said particulate electrode.

3,981,788

CAUSTIC ALKALI PRODUCING MULTIPLE VERTICAL DIAPHRAGM TYPE ELECTROLYTIC CELL ADMITTING OF EASY ASSEMBLY

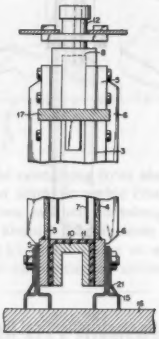
Yoshikazu Kokubu; Isao Okazaki, and Haruo Shikano, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1975, Ser. No. 605,381

Claims priority, application Japan, Aug. 23, 1974, 49-96833

Int. Cl.² C25B *9/02, 1/26*

U.S. Cl. 204—266 **3 Claims**



1. In a caustic alkali-producing multiple vertical diaphragm type electrolytic cell, wherein a plurality of vertical flat box-shaped unit anode chamber sets are assembled in parallel in a cathodic cell case, each said unit anode chamber set comprises main walls formed of a pair of diaphragms and a pair of cathode wire nets stretched on the outside of said diaphragms, and a pair of anode plates received in said anode chamber so as to face said diaphragms, an improvement characterized in that a plurality of conductor metal parts are spatially fitted to the frame of cathode wire nets of each unit anode chamber set at the lower end portion thereof; the outsides of both narrow crosswise walls of each unit anode chamber set are fitted respectively with a ribbed plate; the inner walls of the cell case are fitted with counterpart ribbed plates; and said both ribbed plates are connected with a tightening metal part, to press the unit anode chamber sets against the bottom plate of the cathodic cell case for electrical connection.

3,981,789

APPARATUS FOR OIL DEWAXING

Charles W. Harrison; Herbert J. Pitman, both of Nederland, and Glenn A. Senters, Beaumont, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 16, 1974, Ser. No. 532,961

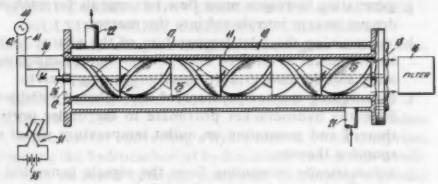
Int. Cl.² C25F *7/02, 7/00*

U.S. Cl. 204—272 **1 Claim**

1. Apparatus for dewaxing oil containing some waxy constituents, comprising in combination,
an elongated cylindrical container for said oil having an inlet and an outlet for permitting said oil to flow therethrough,
said container being constructed of electrically conductive material and forming an electrode for applying an electromotive force to said oil flowing therein,
another electrode being formed by an axially located electrically conductive shaft extending uninterruptedly through said container,

a plurality of thin helical surfaces alternately twisted in opposite rotations and filling said container from said inlet to said outlet for mixing said oil as it flows through,

said helical surfaces being constructed of electrically insulating material and covering said conductive shaft,



circuit means for connecting said electromotive force to said two electrodes including switch means for periodically reversing the polarity thereof,

a jacket surrounding said container for circulating a coolant therein, and

filter means for separating said waxy constituents following crystallization thereof.

3,981,790

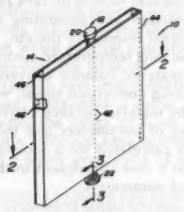
DIMENSIONALLY STABLE ANODE AND METHOD AND APPARATUS FOR FORMING THE SAME

Richard O. Olson, Parma, and Gerald R. Pohto, Mentor, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 368,843, June 11, 1973, Pat. No. 3,895,210. This application Oct. 11, 1974, Ser. No. 514,143

Int. Cl.² C25B *9/00, 11/02, 11/10*

U.S. Cl. 204—286 **7 Claims**



1. A dimensionally stable anode for use in an electrolytic cell comprising:

at least one generally cylindrical anode riser member;

a pair of metal sheets joined to generally diametrically opposite sides of said riser, each sheet having a major, generally planar, extent with first and second spaced edge portions, each said sheet being joined to said riser member such that their respective planar extents are parallel and the first edge portion of each is generally parallel to and aligned with the second edge portion of the other said sheet, the second edge portion of each sheet being bent to have an integral leg portion extending generally toward the first edge portion of the other sheet a distance substantially equal to the outside diameter of said riser member with each leg portion terminating in a tab portion extending parallel to the first edge portion of the other sheet and joined thereto; and,

an electrically conductive surface covering each said sheet.

3,981,791

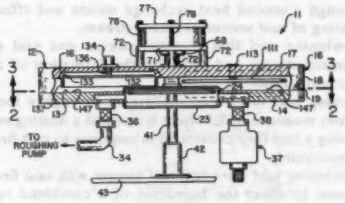
VACUUM SPUTTERING APPARATUS

Warren C. Rosvold, Sunnyvale, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Mar. 10, 1975, Ser. No. 556,584

Int. Cl.² C23C *15/00, 13/08*

U.S. Cl. 204—298 **8 Claims**



1. In a vacuum sputtering apparatus for treating articles, a housing forming a main vacuum chamber having a plurality of work stations therein, at least one sputtering apparatus mounted in at least one of the work stations, means connected to the vacuum chamber for forming a vacuum in the vacuum chamber, said housing having a wall with an opening formed therein through which the articles can be inserted and removed from the main vacuum chamber, first and second sealing members for forming sealing engagement with opposite sides of the wall and forming in combination with the wall a lock chamber, means connected into the lock chamber to create a vacuum in the lock chamber, means for moving the first sealing member into and out of engagement with said wall whereby articles may be inserted into and removed from said chamber, means for moving said second sealing member into and out of engagement with said wall whereby when said sealing member is out of engagement with said wall, articles which have been inserted into the lock chamber can be removed, and means in the main chamber for intermittently advancing articles from the lock chamber and moving the same progressively through the work stations in the main vacuum chamber and thence back into the lock chamber whereby articles can be inserted into the lock chamber, removed therefrom and advanced progressively through the work stations and thereafter inserted in the lock chamber for removal therefrom.

3,981,792

HEAT EXCHANGE METHOD FOR SERIES FLOW REACTORS

Norman H. Scott, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 527,007, Nov. 25, 1974. This application Nov. 6, 1975, Ser. No. 629,726

Int. Cl.² C10G *39/00*

U.S. Cl. 208—49 **15 Claims**

1. A method of heat exchanging a feed stream to a hydrocarbon conversion process which comprises the steps of:

a. passing said feed stream into said process at a measured rate of flow;

b. dividing said feed stream into a first fluid stream having a first rate of flow which is controlled in response to a first temperature and a second fluid stream having a second rate of flow;

c. dividing said second fluid stream into a third fluid stream having a third measured rate of flow which is controlled in response to a second temperature and a fourth fluid stream having a fourth measured rate of flow which is controlled in response to said measured rate of flow of said feed stream;

d. dividing a hydrogen-rich vapor stream into a first portion proportional in quantity to said third measured rate of

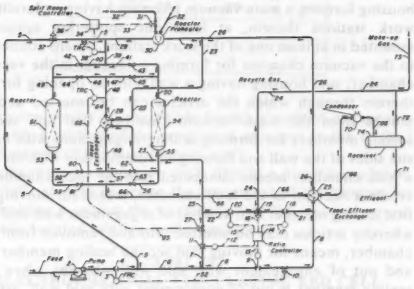
flow and a second portion proportional in quantity to said fourth measured rate of flow, combining said first portion with said third fluid stream to effect the formation of a first reactant stream, and combining said second portion with said fourth fluid stream to effect the formation of a second reactant stream;

e. passing said first reactant stream through a first heat exchange means and effecting a heating of said first reactant stream, and passing said second reactant stream through a second heat exchange means and effecting a heating of said second reactant stream;

f. combining said first reactant stream and said second reactant stream and effecting the formation of a third reactant stream;

g. passing said third reactant stream through a feed preheater means to which there is charged a heating medium having a rate flow controlled in response to said first fluid temperature;

h. combining said third reactant stream with said first fluid stream to effect the formation of a combined reactant stream;



i. passing said combined reactant stream into a first reaction system comprising a first reaction zone to effect the production of a first reaction system effluent stream;

j. measuring a temperature within said first reaction system to determine said first temperature;

k. passing said first reaction system effluent stream into said first heat exchange means to effect the heat exchanging of said first reaction system effluent stream with said first reactant steam;

l. passing said first reaction system effluent stream into a second reaction system comprising a second reaction zone to effect the production of a second reaction system effluent stream;

m. measuring a temperature within said second reaction system to determine said second temperature; and,

n. passing said second reaction system effluent stream into said second heat exchange means to effect the heat exchanging of said second reaction system effluent stream with said second reactant stream.

3,981,793

AUTOMATIC CONTROL OF A HYDROCRACKER

David A. Christie, and James W. Hobbs, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 30, 1975, Ser. No. 591,920

Int. Cl.[2] C10G *13/00*

U.S. Cl. 208—108 **11 Claims**

1. A method for controlling the conversion of a hydrocracker comprising

a. passing a stream of fresh oil feed into the feed inlet portion of said hydrocracker as part of the charge thereto,

b. passing at least one hydrogen stream into the feed inlet portion of said hydrocracker as part of the charge thereto,

c. withdrawing reactor effluent from said hydrocracker,

d. separating from said reactor effluent a recycle oil stream,

e. passing said recycle oil stream into the feed inlet portion of said hydrocracker as part of the charge thereto,

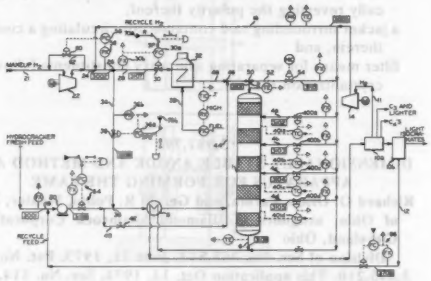
f. determining the rate of total oil flow into the hydrocracker and generating a total oil flow rate signal responsive thereto,

g. generating hydrogen mass flow rate signals for each hydrogen stream introduced into the reactor,

h. determining the inlet temperature of the charge to the hydrocracker at the feed inlet portion thereof and generating an inlet temperature signal responsive thereto,

i. determining the temperature of the effluent withdrawn from the hydrocracker proximate to the outlet portion thereof and generating an outlet temperature signal responsive thereto,

j. automatically computing from the signals generated in step (f) through (i) an enthalpy balance conversion and generating an enthalpy balance conversion signal responsive thereto,



k. determining the flow rate of said recycle oil stream and generating a recycle oil flow rate signal,

l. automatically computing from said total oil flow rate signal and from said recycle oil flow rate signal a material balance conversion and generating a material balance conversion signal responsive thereto,

m. generating an inlet temperature control signal responsive to both the material balance conversion signal and the enthalpy balance conversion signal, with the further provision that the material balance conversion is calculated for a first set of parameters and the enthalpy balance conversion is calculated for a second set of parameters determined at a time subsequent to the determination of the first set of parameters,

n. generating a control signal responsive to the inlet temperature control signal and the inlet temperature signal.

o. regulating the temperature of the charge to the hydrocracker at the feed inlet port thereof responsive to said control signal such as to control the actual conversion rate of the hydrocracker to keep it at a desired value.

3,981,794

AROMATIZATION PROCESS AND CATALYSTS

Paul E. Eberly, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 395,935, Sept. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 183,382, Sept. 24, 1971, abandoned. This application Dec. 9, 1974, Ser. No. 531,061

Int. Cl.[2] C10G *35/08;* **C07C** *5/30;* **B01J** *23/16*

U.S. Cl. 208—138 **24 Claims**

1. Process for the preparation of aromatic hydrocarbons from a feedstream containing n-C_6^+ hydrocarbons selected from the group consisting of paraffins, olefins and mixtures thereof comprising contacting said feedstream in a reaction zone maintained at temperatures ranging from about 600° to about 1200°F. and at pressures ranging from about 0 to about 300 psig with a catalyst consisting essentially of from about

0.05 to about 5% of palladium metal, from about 0.1 to less than 2% chromium oxides, and from about 0.01 to about 4.5% by weight of an alkali metal oxide promoter, on a high surface area support.

3,981,795

HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 8, 1975, Ser. No. 602,935

Int. Cl.² C10G *35/08*; C07C *3/28*, *5/32*; B01J *23/62*

U.S. Cl. 208—139 **23 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % bismuth, and about 0.1 to about 3.5 wt. % halogen, wherein the platinum group metal, catalytically available cobalt, and bismuth are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state, and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

3,981,796

DESULFURIZATION OF BLACK OIL UTILIZING A PRETREATED COBALT-MOLYBDENUM CATALYST

Lee Hilfman, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 418,700, Nov. 23, 1973, Pat. No. 3,933,683. This application July 21, 1975, Ser. No. 597,627

Int. Cl.² C10G *23/02*; C07C *5/10*; B01J *27/04*

U.S. Cl. 208—215 **2 Claims**

1. A black oil desulfurization process utilizing a hydrogenation catalyst containing cobalt and molybdenum components present in oxide form which catalyst is activated according to a method which comprises the steps of:

a. intimately contacting said hydrogenation catalyst with gaseous hydrogen, containing a sulfur compound, at a temperature within the range of from about 550°F. to about 800°F. for a sufficient time to effect the reduction and sulfiding of a major proportion of said components; and,

b. stripping the resulting reduced and sulfided catalyst with substantially pure hydrogen at a temperature within the range of from about 750°F to about 900°F.

3,981,797

CONTROL OF HYDROCARBON DEASPHALTING PROCESS

James S. Kellar, Des Plaines; Don B. Carson, Mount Prospect, and David M. Boyd, Claredon Hills, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed July 21, 1975, Ser. No. 597,625

Int. Cl.² C10G *21/00*

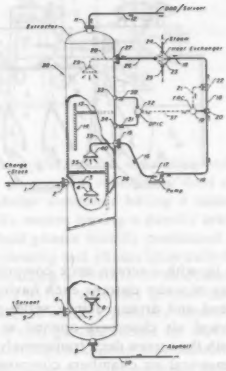
U.S. Cl. 208—309 **13 Claims**

1. A process for deasphalting an asphalt-containing hydrocarbonaceous charge stock, in a solvent extraction zone, which comprises the steps of:

a. countercurrently contacting said charge stock, introduced into said extraction zone through a first locus thereof, with a hydrocarbon-selective solvent, introduced into said zone through a lower second locus thereof, at extraction conditions selected to produce a solvent-lean asphaltic stream and a solvent-rich hydrocarbon stream;

b. withdrawing said asphaltic stream from said extraction zone through a third locus thereof, said third locus being below said second locus, and a solvent-rich deasphalted oil stream from an upper fourth locus thereof;

c. withdrawing at least a portion of said solvent-rich hydrocarbon stream through a fifth locus intermediate said first and fourth loci, sid fifth locus being in open communication with a lower liquid-collecting zone within a divided top-heating section of said extraction zone;



d. increasing the temperature of said portion of the solvent-rich hydrocarbon stream and introducing the heated portion into said extraction zone through a sixth locus intermediate said fourth and fifth loci, said sixth locus being in open communication with an upper liquid-collecting zone within said divided top-heating section;

e. determining the pressure differential between said lower and upper liquid-collecting zones; and,

f. adjusting the rate at which said solvent-rich hydrocarbon stream is withdrawn through said fifth locus in response to said differential pressure.

3,981,798

LIQUID/LIQUID EXTRACTION USING CERTAIN ETHERS AND ESTERS

Donald G. Ries, and David G. Braithwaite, both of Brookhaven, Miss., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 501,519, Aug. 29, 1974, abandoned. This application May 5, 1975, Ser. No. 574,209

Int. Cl.² C10G *21/16*

U.S. Cl. 208—323 **3 Claims**

1. A process for the liquid/liquid extraction of aromatic hydrocarbons from organic solvent mixtures which comprises the steps of:

A. contacting the organic solvent mixture with an extractant selected from the group consisting of mono-methylether of glycerine, monoethylether of glycerine and a mixture of glycerine monoacetate and glycerine diacetate in a volume ratio to the solvent mixture of from 1:10 to 10:1;

B. mixing the extractant with the organic solvent mixture for a period of time necessary to extract substantially all of the aromatic hydrocarbons into the extractant;

C. separating the extractant containing aromatic hydrocarbons from the organic solvent mixture;

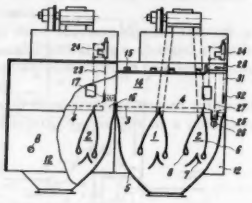
D. recovering the aromatic hydrocarbons from the extractant.

3,981,799

BAUM JIG

Antoni Jedo, Gliwice, Poland, assignor to Centralny Osrodek Projektowokonstrukcyjny Maszyn Gorniczych "Komag", Gliwice, Poland

Filed May 29, 1975, Ser. No. 581,921
Claims priority, application Poland, May 30, 1974, 171533
Int. Cl.² B03B 5/20
U.S. Cl. 209—457 12 Claims



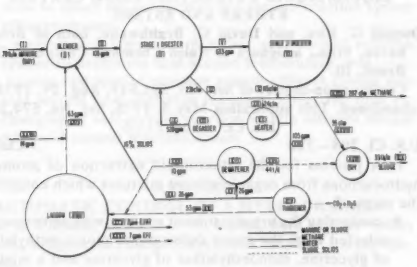
1. A baum jig with a screen deck comprising, in combination, a number of water cisterns each having a feed end and a discharge end and arranged in a series-paralleled system with symmetrical air chambers opened at the bottom and located beneath the screen deck transversely to the axis of the jig, said symmetrical air chambers comprising plates as sections of a cylindrical surface, the symmetry axes of said air chambers being deflected from the perpendicular by an angle of 5° to 15° toward said feed end, said chambers having asymmetric guide vanes displaceable in a horizontal direction.

3,981,800

HIGH QUALITY METHANE GAS THROUGH MODIFIED ANAEROBIC DIGESTION

Jay E. Ort, Lewistown, Pa., assignor to ERA, Incorporated, Clovis, N. Mex.

Filed Nov. 22, 1974, Ser. No. 526,176
Int. Cl.² C02C 1/14
U.S. Cl. 210—6 17 Claims



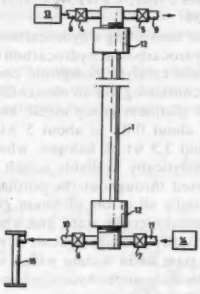
1. In anaerobic digestion of organic solid waste to produce methane gas in a digester, the improvement wherein the digestion is effected, so that gas in the digester is under a pressure of at least one atmosphere in excess of atmospheric pressure so that digesting organic solid waste preferentially absorbs carbon dioxide.

3,981,801

GRADIENT STORAGE METHOD FOR LIQUID CHROMATOGRAPHY

John Henderson Knox, Edinburgh, Scotland, assignor to University of Edinburgh, Edinburgh, Scotland

Filed Feb. 14, 1974, Ser. No. 442,583
Claims priority, application United Kingdom, Feb. 14, 1973, 7142/73
Int. Cl.² B01C 15/08
U.S. Cl. 210—31 C 9 Claims



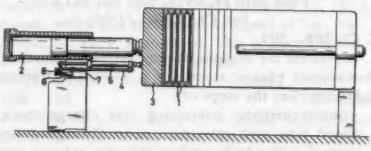
1. A process for the preparation, storage and subsequent pressurized delivery of a sample liquid whose composition varies in a reproducible and controllable way from one region of its volume to another, comprising filling an elongate tube with a first liquid, the geometrical dimensions of said tube being chosen so that a sharply defined band of one liquid whose composition differs from that of a surrounding liquid is dispersed in a reproducible way when said band is passed at a specified rate through said tube, subsequently introducing into said tube a second liquid miscible with said first liquid so as to displace at least part of said first liquid, the composition of the second liquid being controlled during the introduction procedure according to a prearranged programme to effect a predetermined dispersion of said second liquid which forms a precursor sample, closing at least one end of said tube to hold and store said precursor sample within said tube, and subsequently expelling said precursor sample at the outlet of said tube into pressurized equipment to form the sample liquid whose composition varies in a reproducible and controlled manner from one region of its volume to another.

3,981,802

PLATE TYPE PRESS FILTER

Alfons Schotten, Duren; Hermann Jösef Spolgen, D'horn, and Ulrich Rilling, Stolberg, all of Germany, assignors to Eberhard Hoesch & Sohne, Duren, Germany

Filed Mar. 26, 1975, Ser. No. 562,161
Claims priority, application Germany, Mar. 30, 1974, 2415598
Int. Cl.² B01D 25/12
U.S. Cl. 210—91 13 Claims



1. In a filter press having a support frame; a plurality of face-to-face oriented filter plates forming a filter plate stack; means for movably supporting the filter plates with respect to

one another; a closing device connected to the filter plates for exerting thereon a pressure with which the filter plates are urged to one another; and a closing pressure regulator coupled to the closing device; the improvement comprising:

a. a stationarily supported path-sensing signal transmitter means operatively connected to said closing pressure regulator; and

b. a sensor arm attached at least indirectly to one of said filter plates for displacing said sensor arm by, and as a function of the motion of, said one filter plate; said sensor arm being operatively coupled to said path-sensing signal transmitter means for controlling the closing pressure of said closing device by said signal transmitter means as a function of the position of said sensor arm.

3,981,803
METHOD AND APPARATUS FOR ANAEROBIC FERMENTATION

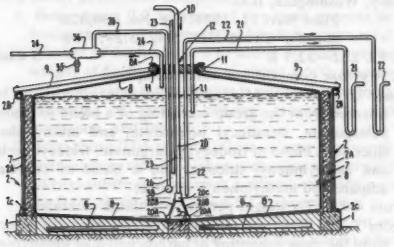
John Louis Coulthard, Lot 9, Frankston Rd., Cranbourne South, 3977, Victoria, Australia

Division of Ser. No. 304,785, Nov. 8, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,899

Claims priority, application Australia, Nov. 11, 1971, 7000/71

Int. Cl.² C02C 1/14

U.S. Cl. 210—178 **11 Claims**



1. Apparatus for use in the anaerobic fermentation of organic waste material in a digestion zone comprising:

a. a bag-like container made of flexible material for digesting organic waste materials, said container having an opening, a closure member for sealing said opening;

b. inlet and outlet means extending through said closure member into said bag-like container for the introduction of said waste materials and the simultaneous removal of liquid and gaseous products, respectively;

c. a wall disposed about said container for supporting said container, said wall comprising a series of interconnected panels extending in substantially vertical planes to form a self-supporting structure;

d. at least one layer of insulating material disposed between said bag-like container and said wall;

e. a support member having one end supported on said wall, said support member extending over said bag-like container;

f. said bag-like container having an upper surface adjacent said support member, and means for securing said upper surface to said support member;

g. a mixing tank including mixing means for mixing waste materials in said mixing tank, said mixing tank being in communication with said inlet means for passing said waste materials from said mixing tank through said inlet means into said bag-like container;

h. gas storage means connected to said outlet means for said gaseous products, for storing said gaseous products.

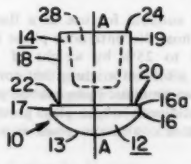
3,981,804
APPARATUS FOR SEPARATING MULTIPHASE FLUIDS

Joseph F. Gigliello, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed June 25, 1975, Ser. No. 590,127

Int. Cl.² B01D 21/26

U.S. Cl. 210—516 **6 Claims**



1. An improved apparatus for separating and partitioning different density phases of a multiphase fluid such as blood comprising, a tubular container having a closed end, inert thixotropic gel-like means having a density intermediate the density of said fluid phases initially positioned adjacent said closed end for separating said phases upon centrifugation, said gel-like means including a mixture of an oil and a filler and flow control means having a density greater than the density of said gel-like means initially partially submerged within a surface portion of said gel-like means for directing the flow thereof during centrifugation along wall portions of said container, wherein the improvement comprises: said flow control means including a bottom portion and a top portion extending upwardly from said bottom portion, and said top portion having an annular recessed region formed therein such that said recessed region provides an annular space between wall portions of said top portion and said container adjacent the surface of said gel-like means.

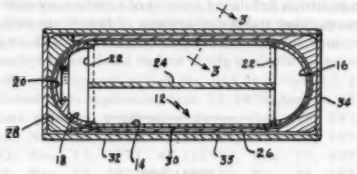
3,981,805
HIGH TEMPERATURE RADIOISOTOPE CAPSULE

George B. Bradshaw, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 846,996, July 28, 1969. This application Sept. 13, 1972, Ser. No. 287,160

Int. Cl.² G21G 4/00

U.S. Cl. 250—493 **6 Claims**



1. A high temperature radioisotope capsule comprising a first innermost cylinder, said cylinder having at least one radial heat conduction fin mounted therein, a second cylinder surrounding said first cylinder, a first space separating said first cylinder from said second cylinder, a gas located in said space, an outer structure encasing said second cylinder, a second space separating said second cylinder from said outer structure and a gas located in said second space.

3,981,806

FLAME-RETARDANT EMULSION CONTAINING 1,1,2,3,4,4-HEXABROMOBUTENE-2

Eugene P. Di Bella, Piscataway, N.J.; Donald A. Keyworth, Houston, Tex., and Marvin Rosen, Warren, N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Division of Ser. No. 423,564, Dec. 10, 1973. This application Sept. 15, 1975, Ser. No. 613,771

Int. Cl.² C09K *3/28*

U.S. Cl. 252—8.1 **12 Claims**

1. An emulsion suitable for use as a flame-retardant for textile materials whose discontinuous phase is a solution containing about 5% to 25% by weight of 1,1,2,3,4,4-hexabromobutene-2 in a solvent mixture that contains 1 part to 5 parts by weight of an aromatic hydrocarbon per part by weight of an N-alkylpyrrolidinone whose alkyl group has 1 to 5 carbon atoms and whose continuous phase is water.

3,981,807

DURABLE TEXTILE TREATING ADDUCTS

Stuart Raynolds, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 27, 1973, Ser. No. 401,128

Int. Cl.² D06M *13/20*; **D01M** *13/34*

U.S. Cl. 252—8.8 **10 Claims**

1. In an adduct for application to a textile article for the purpose of improving the functional performance of the article, the improvement consisting essentially of including in the adduct and chemically bonding therein about from 5 to 50 weight percent of a durabilizing organic moiety having a melting point between about 100° and about 300°C. and a Solubility Parameter differing by at least one unit from the Solubility Parameter of the functional component of the adduct.

3,981,808

SOLUBLE OIL CONCENTRATE

Gifford G. McClaflin, and Albert M. Durr, Jr., both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Oct. 15, 1975, Ser. No. 622,598

Int. Cl.² C10M *1/40*, *3/34*, *5/22*; **B21B** *45/02*

U.S. Cl. 252—33.3 **4 Claims**

1. A soluble oil concentrate composition comprising:
a. a major amount of paraffinic base oil;
b. a major amount of naphthenic base oil;
c. an emulsion stabilizing amount of a mahogany sulfonate;
d. an emulsion stabilizing amount of fatty/rosin acid; and
e. a minor amount of each of a naphthenic acid, an alkylol amine, an alkylene glycol and an alkali metal hydroxide.

3,981,809

BIS-ANILINE DISULFIDE REACTION PRODUCTS AS MULTIFUNCTIONAL LUBRICATING OIL ADDITIVES

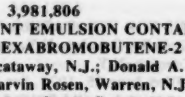
Gunter Caspari, Wheaton, Ill., assignor to Standard Oil Company, Chicago, Ill.

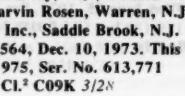
Filed Dec. 10, 1975, Ser. No. 639,330

Int. Cl.² C10M *1/48*, *3/42*, *5/24*, *7/46*

U.S. Cl. 252—32.7 E **20 Claims**

1. A lubricating oil composition containing from about 0.01 weight percent to about 5 weight percent of an oil-soluble multifunctional additive comprising the reaction product of bis-aniline disulfide with

a)  ; or

b)  ; or

c. phosphosulfurized olefin;

where R_1, R_2 and R_3 are hydrocarbyl or chloro, bromo or hydroxy substituted hydrocarbyl.

16. A lubricating oil composition containing from about 0.01 weight percent to about 5 weight percent of an oil-soluble multifunctional additive comprising
a. aniline disulfide dihydrocarbyl phosphoramide; or
b. aniline disulfide dihydrocarbyl dithiophosphate; or
c. aniline disulfide-phospho-sulfurized olefin;
where the hydrocarbyl groups are entirely hydrocarbon, or chloro, bromo or hydroxy substituted hydrocarbon.

3,981,810

GREASE COMPOSITION

Robert N. Bolster, Fairfax County, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 11, 1975, Ser. No. 630,826

Int. Cl.² C10M *1/48*, *3/42*, *5/24*, *7/46*

U.S. Cl. 252—32.7 E **5 Claims**

1. A grease composition which comprises:
from 82 to 89 weight percent of an ester-silicone oil base selected from the group consisting of a blend of isodecyl pelargonate, hexadecyl isostearate, and methyl-phenyl silicone, a blend of isodecyl pelargonate, tridecyl azelate, and methylphenyl silicone, and a blend of ethylhexyl adipate and methylphenyl silicone;
from 4.9 to 7.5 weight percent of lithium stearate;
from 1.7 to 3 weight percent of a rust inhibitor selected from the class consisting of barium and lead dinonylnaphthalene sulfonate;
from 1.5 to 5 weight percent of antimony dialkylphosphorodithioate;
from 0.25 to 0.6 weight percent of a copper-silver corrosion inhibitor selected from the class consisting of tolyltriazol, disalicylal-propylene-diamine, and 2-mercaptobenzothiazole; and
from 0.2 to 0.6 weight percent of 2,6-di-tert-butyl-4-methylphenol.

3,981,811

SILICONE FLUIDS AS A CORROSION INHIBITOR FOR PERFLUORINATED POLYETHER FLUIDS

Alex Zletz, Naperville, Ill., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 14, 1976, Ser. No. 649,105

Int. Cl.² C10M *1/10*, *1/50*, *7/02*, *7/48*

U.S. Cl. 252—49.6 **4 Claims**

1. A lubricating composition comprising (1) a major amount of a perfluorocarbon polyether fluid and (2) a minor corrosion inhibiting amount of a silicone fluid selected from the group consisting of methylphenyl silicone, chlorophenylmethyl silicone, and methyltrifluoropropyl silicone.

2. The lubricating composition of claim 1 wherein the polyether fluid is thickened to a grease consistency with at least one thickening agent selected from the group consisting of p-oxybenzoyl polymer and 2,4-diamino-6-hydroxy-1,3,5-triazine.

3,981,812

HIGH TEMPERATURE THERMALLY STABLE GREASES

Alex Zletz, Naperville, Ill., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 14, 1976, Ser. No. 649,104
Int. Cl.² C10M *1/10, 1/50, 7/02, 7/48*
U.S. Cl. 252—49.6 1 Claim

1. A lubricating grease composition composed of a mixture of from about 4 to about 13 percent by weight of a substituted polyphenylene thickening agent selected from the group consisting of nitropolyphenylene and aminopolyphenylene; from about 0.75 to about 10 percent by weight of a silicone co-thickening agent selected from the group consisting of dimethyl silicone and phenylmethyl silicone; and the balance substantially all a perfluoropolyether lubricating vehicle.

3,981,813

HYDRAULIC FLUID

Marvin J. Den Herder, Olympia Fields, and Thomas Martin Warne, Wheaton, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 12, 1975, Ser. No. 576,362
Int. Cl.² C10M *1/40*
U.S. Cl. 252—75 18 Claims

1. A hydraulic fluid composition comprising:

a. a major proportion of a hydrocarbon oil having a viscosity of from about 10 to about 200 centistokes at 100°F., and

b. a minor proportion comprising:

1. from about 0.3 to about 3.0 weight percent in said hydrocarbon oil of a metal sulfonate having a total base number of from about 5 to about 80 and a molecular weight of from about 400 to about 1,500, wherein the metal in said metal sulfonate is selected from the group consisting of barium, calcium, magnesium, sodium, potassium, and lithium;

2. from about 0.05 to about 0.60 volume percent in said hydrocarbon oil of a higher molecular weight alkyl- or alkenyl-substituted succinic acid or anhydride containing from about 50 to about 90 carbon atoms;

3. from about 0.01 to about 0.50 volume percent in said hydrocarbon oil of a lower molecular weight alkyl- or alkenyl-substituted succinic acid or anhydride containing a total of from about 12 to about 34 carbon atoms; and

4. from about 0.02 to about 0.60 volume percent in said hydrocarbon oil of an ethoxylated fatty alcohol or alkylphenol, having an HLB of from about 7 to about 15 and having the formula

$$R-(OCH_2CH_2)_n-OH$$

wherein R is an oil-soluble group selected from the class consisting of a first alkyl group having from about 8 to about 30 carbon atoms and an alkaryl group having a total of up to 36 carbon atoms and having only one aromatic ring and from 1 to 3 second alkyl groups wherein at least one of said second alkyl groups contains from about 8 to about 30 carbon atoms, and n is about 4 to about 70.

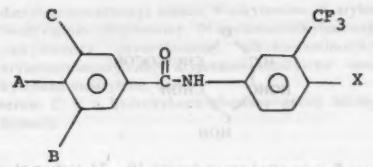
3,981,814

BACTERIOSTATIC SUBSTITUTED BENZANILIDE COMPOSITIONS AND METHODS FOR THEIR USE

Edward J. Nikawitz, Glen Rock, N.J., assignor to Givaudan Corporation, Clifton, N.J.

Continuation of Ser. No. 398,522, Sept. 18, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 570,140
Int. Cl.² C11D *3/48, 9/50*
U.S. Cl. 252—107 41 Claims

1. A bacteriostatic detergent composition comprising a soap or detergent of the anionic, cationic, nonionic or amphoteric type and a bacteriostatically effective amount of a benzanilide having the formula:



wherein:

A is selected from the group of H, Cl, Br, CF_3 and $C(CH_3)_3$;

B is selected from the group of H, Cl and Br;

C is selected from the group of H and Cl; and

X is selected from the group of H, Cl, Br and F;

except:

when X is Cl, C must be H; and

wherein:

at least one of the groups A, B, C or X must be Cl or Br and the positions in the phenyl moieties ortho to the —CO— and —NH— are free of substituents.

3,981,815

PROCESS FOR UTILIZING COLLECTED MATERIAL REMOVED FROM EFFLUENT GAS

Masao Taniguchi, Tokyo; Sueo Machi, Takasaki; Waichiro Kawakami, Takasaki; Shoji Hashimoto, Takasaki; Keita Kawamura, Yokohama, and Shingi Aoki, Fujisawa, all of Japan, assignors to Ebara Manufacturing Co., Ltd., Tokyo, Japan

Filed Sept. 16, 1974, Ser. No. 506,571
Claims priority, application Japan, Sept. 21, 1973, 48-106697; Sept. 21, 1973, 48-106698; Sept. 21, 1973, 48-106700; Sept. 21, 1973, 48-106702; Sept. 21, 1973, 48-106703
Int. Cl.² B01D *53/34;* B01J *1/10*
U.S. Cl. 252—182 3 Claims

1. A process for recovering effective components from effluent gas containing sulfur dioxide and nitrogen oxides, which comprises irradiating the effluent gas with an ionizing radiation to form an aerosol, and then collecting the aerosol by a collecting means, and decomposing the resulting collected material, characterized by forming paste of the collected material, and subjecting the paste to steam-roasting to form a vapor of a mixed acid of sulfuric acid and nitric acid, and condensing the vapor by water to form a liquid of the mixed acid.

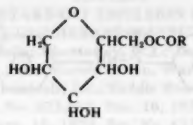
3,981,816

LIQUID CRYSTAL DISPLAY DEVICE

Akio Moriyama, Katano; Masakazu Fukai, Nishinomiya; Komei Asai, Hirakata, and Koshiro Mori, Nara, all of Japan, assignors to Matsushita Electric IndustrialCo., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 415,361, Nov. 13, 1973, abandoned. This application Sept. 15, 1975, Ser. No. 613,425
Claims priority, application Japan, Nov. 15, 1972, 47-114965; Nov. 16, 1972, 47-115374; Nov. 17, 1972, 47-115793; Nov. 17, 1972, 47-115794; Nov. 17, 1972, 47-115795; Nov. 17, 1972, 47-115829; Nov. 20, 1972, 47-116919; Nov. 20, 1972, 47-116981; Nov. 20, 1972, 47-116982; Nov. 20, 1972, 47-116983; Nov. 20, 1972, 47-116984; Nov. 20, 1972, 47-116986; Nov. 20, 1972, 47-116987; Nov. 20, 1972, 47-116992; Nov. 20, 1972, 47-116993; Nov. 20, 1972, 47-116994; Nov. 20, 1972, 47-116995; Nov. 20, 1972, 47-116996
Int. Cl.² G02F *1/13;* C09K *3/34*
U.S. Cl. 252—299 4 Claims

1. A liquid crystal display device employing a nematic liquid crystal composition containing at least one homeotropic aligning additive having the following general formula:



wherein R is an alkyl group having 10 – 24 carbon atoms.

3,981,817

MIXTURES OF LIQUID CRYSTALS

Arthur Boller, Binningen, and Hanspeter Scherrer, Therwil, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 27, 1974, Ser. No. 455,083

Claims priority, application Switzerland, Apr. 4, 1973, 4799/73

Int. Cl.² G02F *1/16*

U.S. Cl. 252—299 **11 Claims**

1. A mixture which contains p-n-octylbenzoic acid p'-cyanophenyl ester, p-n-hexylbenzoic acid p'-cyanophenyl ester and p-n-butylbenzoic acid p'-cyanophenyl ester in a molar ratio of 1:1:1.

3,981,818

CRYSTALLINE MATERIALS

Carl F. Swinehart, University Heights, and Marko Sfiligoj, South Euclid, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Division of Ser. No. 193,206, Oct. 26, 1971, Pat. No. 3,766,080, and a continuation-in-part of Ser. No. 314,952, Oct. 9, 1963, abandoned, said Ser. No. 193,206 is also a continuation-in-part of said Ser. No. 314,952. This application Oct. 15, 1973, Ser. No. 406,585

Int. Cl.² G02B *5/20*

U.S. Cl. 252—300 **2 Claims**

1. A process for making an infrared transmitting non-cleaving, cooled and solidified melt comprising the steps of mixing two infrared-transparent solid components capable of forming a eutectic in proportions to yield approximately the eutectic mixture, heating the mixture to form a melt of the two solid phases, solidifying the melt in a controlled manner by adding heat to the melt and removing same from the solids during said solidification step, the amount of heat being added to the melt and conducted through the solidifying melt is 10^3 to 10^5 times the latent heat of fusion of said eutectic mixture, and cooling the solid mixture.

3,981,819

LUMINESCENT SULFIDES OF MONOVALENT AND TRIVALENT CATIONS

Perry Niel Yocom, Princeton, and John Pickett Dismukes, South Branch, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,813

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² C09K *11/08*

U.S. Cl. 252—301.4 S **7 Claims**

1. A luminescent material, having a crystal structure similar to that of alpha sodium ferric oxide and the empirical formula

$$(\alpha\ Ma\ \gamma\ Mc\ \delta/2\ Md)\ (\beta\ Mb\ \delta/2\ Md\ \epsilon\ Me)\ S_2$$

wherein:

Ma is at least one monovalent cation selected from the group consisting of Na, K, Rb and Cs,

Mb is at least one trivalent cation selected from the group consisting of Gd, La, Lu, Sc and Y,

Mc is at least one monovalent cation selected from the group consisting of silver, copper and thallium,

Md is at least one divalent cation selected from the group consisting of europium, manganese, lead and tin,

Me is at least one trivalent cation selected from the group consisting of arsenic, bismuth, cerium, dysprosium, erbium, praseodymium, antimony, samarium, terbium and thulium,

S is sulfur,

α is 1.00 minus γ minus $\delta/2$,

β is 1.00 minus ϵ minus $\delta/2$,

γ, δ and ϵ are each in the range of 0.00 to 0.05 mol, and

γ plus δ plus ϵ is in the range of 0.00005 to 0.05 mol.

3,981,820

ANTISKID COATING

Richard C. Miller, and Charles C. Payne, both of Chicago, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 390,897, Aug. 23, 1973, Pat. No. 3,930,063. This application June 16, 1975, Ser. No. 587,320

Int. Cl.² C09K *11/00, 3/14*

U.S. Cl. 252—301.16 **4 Claims**

1. A liquid coating composition for application to substrates to impart antiskid properties thereto, comprising: an aqueous silica sol containing a fluorescent dye.

3,981,821

PROCESS FOR PREPARING MICROCAPSULES

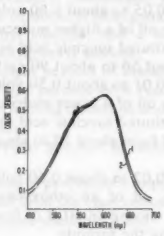
Masataka Kiritani, and Yasuhiro Ogata, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed July 17, 1974, Ser. No. 489,283

Claims priority, application Japan, July 17, 1973, 48-81624

Int. Cl.² B01J *13/02*

U.S. Cl. 252—316 **4 Claims**



1. A process for preparing microcapsules which comprises emulsifying a hydrophobic liquid as droplets thereof in a hydrophilic liquid immiscible therewith as a continuous phase, polymerizing at least one capsule wall-forming substance present in the continuous phase and selected from the group consisting of a combination of an amino containing compound and an epoxy compound; a combination of an amino compound and an aldehyde compound; a combination of a urea resin and an aldehyde compound; a combination of a urea resin and an amino compound; a combination of a melamine resin and an amino compound; a combination of a melamine compound and an aldehyde compound; a self-polymerizable urea resin; and a self-polymerizable melamine resin, and depositing the resulting polymer around the droplets of the hydrophobic liquid thereby to envelop the hydrophobic liquid droplets from outside; wherein the hydrophobic liquid prior to emulsification contains a deposition promoting agent which is reactive with said at least one wall-forming substance in the continuous phase and consequently promotes the deposition of the polymer resulting in the continuous phase, said agent being used in an amount sufficient to promote said deposition, said agent being selected from the group consisting of a hydrophobic liquid soluble isocyanate compound, a hydrophobic liquid soluble amino compound, a hydrophobic liquid soluble

acid chloride, a hydrophobic liquid soluble epoxy compound, a hydrophobic liquid soluble compound containing chloroformate groups, and a hydrophobic liquid soluble aldehyde compound, the weight ratio between the amount of the deposition promoting agent and the amount of the capsule wall-forming substance is 0.16 to 0.4.

3,981,822

NOVEL COMBINATIONS OF ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

James C. Ownby, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

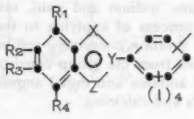
Filed Sept. 19, 1975, Ser. No. 615,032
Int. Cl.² C09K *15/30, 15/28, 15/16*
U.S. Cl. 252—403 **14 Claims**

1. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of a mixture of:

1. at least one heterocyclic compound having the formula:

A-I or A-B-C

wherein A is a group having the structure



wherein

X and Y are a carbon atom, a carbon atom containing an R group or a nitrogen atom;

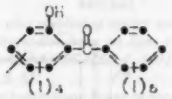
Z is an oxygen atom, a sulfur atom, a nitrogen atom, or a nitrogen atom containing a hydrogen atom or an alkyl group having 1 to 12 carbon atoms or an aryl or substituted aryl group having 6 to 18 carbon atoms;

R, R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, arylsubstituted-aryl, alkoxy, substituted amino, cyano, carboalkoxy and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the Y substituent and the carbon atom attached to the B group connecting the heterocyclic aromatic A group with the aromatic C group, said B connecting group is attached to the benzenoid ring in the ortho, meta or para positions from the carbon atom connected to the Y substituent, said I substituents can all be the same substituent listed above or different listed substituents;

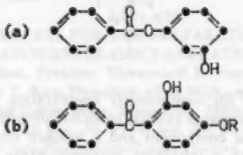
B is a linking group connecting A and C and can be alkylene, arylene, carbonyl, carbonyloxy, oxycarbonylalkyleneoxy, oxycarbonyl, alkyleneoxycarbonyloxy, oxyalkylenecarbonyl, oxycarbonyloxy, alkyleneoxy, oxyalkylene, alkyleneoxyalkyleneoxy, thio, thioalkyleneoxy, sulfinyldioxy, oxy(alkoxy)phosphinooxy, alkyloxyphosphinylidene, aryloxyphosphinylidene, oxy(alkyl)phosphinyloxy, aminocarbonyl, N-alkylaminocarbonyl, N-arylaminocarbonyl, aminocarbonylalkyleneoxy, N-alkylaminocarbonylalkyleneoxy, N-arylaminocarbonylalkyleneoxy, aminocarbonylamino, N-alkylaminocarbonylamino, N,N-dialkylaminocarbonyl, N-arylaminocarbonyl, N-alkylaminocarbonyl, N,N-diarylaminocarbonyl, amino, N-alkylamino, N-arylamino, N-alkylaminoalkyleneoxy, N-arylaminoalkyleneoxy, oxyalkyleneoxy, oxyaryleneoxy, alkyleneaminoalkylene, aryleneaminoarylene, aryleneaminoalkylene and alkyleneaminoarylene; and

wherein C is a hydroxybenzophenone group having the formula



where I is the same substituent as listed above and is present in all positions of the benzenoid rings except the carbon atom attached to the B group connecting the A and C moieties, said B connecting group is attached to the benzenoid ring in the ortho, meta or para position from the keto group of the benzophenone, and said I substituents can all be one of the substituents listed above or different listed substituents, and

2. at least one compound selected from the group consisting of:



wherein R is hydrogen or an alkyl group of 1 to 20 carbon atoms.

3,981,823

REGENERATION OF IRIDIUM-CONTAINING CATALYSTS

David J. C. Yates, Westfield, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

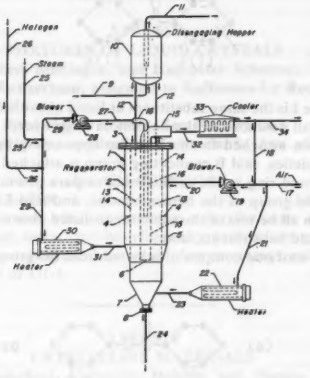
Continuation-in-part of Ser. No. 343,304, March 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 248,683, April 28, 1972, abandoned. This application Sept. 23, 1974, Ser. No. 508,104
Int. Cl.² B01J *23/96;* **C10G** *35/08*
U.S. Cl. 252—415 **16 Claims**

1. A process for regenerating a supported hydrocarbon reforming catalyst containing at least about 0.1 wt. % iridium in the metallic form, wherein the support is a refractory inorganic oxide, the catalyst being at least partially deactivated by the presence of carbonaceous deposits thereon which comprises the steps of (1) contacting said catalyst with an oxygen-containing gas at a temperature of at least 300°C. for a time sufficient to burn at least a substantial portion of said carbonaceous deposits from said catalyst; (2) contacting catalyst treated in step (1) with a reducing gas selected from the group consisting of hydrogen, carbon monoxide, nitric oxide, and mixtures thereof at an elevated temperature for a time sufficient to convert at least a portion of said iridium to its metallic form; and (3) contacting the catalyst containing iridium at least a portion of which has been reduced to the metallic form with a gas containing a halogen and oxygen at a temperature of at least 300°C., the oxygen being present in an amount sufficient to enhance the dispersion of the iridium on the catalyst but less than 5% by volume, at an oxygen partial pressure not exceeding about 0.1 atmosphere.

3,981,824
REGENERATION METHOD FOR GRAVITY-FLOWING CATALYST PARTICLES

Arthur R. Greenwood, Niles, and Earl S. Lemberger, Buffalo Grove, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 13, 1974, Ser. No. 523,288
Int. Cl.² B01J *23/96;* **C10G** *35/08*
U.S. Cl. 252—415 **5 Claims**



1. A method for continuously regenerating deactivated hydrocarbon conversion catalyst particles comprising a Group VIII noble metal component and a halogen component in combination with a refractory inorganic oxide, and which particles have been deactivated by deposition of carbonaceous matter thereon and loss of halogen therefrom, said method comprising the steps of:

a. passing said catalyst particles downwardly by gravity flow through a vertically positioned confined regeneration zone maintained at a temperature of from about 750°F. to about 1050°F. and having an interconnecting upper carbon-burning section, with an intermediate halogenation section in interconnection with a lower drying section in descending sectional order;

b. introducing said deactivated hydrogen conversion catalyst particles to said carbon-burning section and a first air stream from an external source through a carbon-burning inlet port to said carbon-burning section;

c. burning substantially all of the carbonaceous matter from the catalyst particles in said carbon-burning section;

d. withdrawing the excess air and combustion products from said carbon-burning section through a carbon-burning withdrawal port and cooling at least a portion thereof;

e. recycling at least a portion of said cooled excess air and combustion products to said carbon-burning section through said carbon-burning inlet port;

f. introducing the catalyst particles in the carbon-burning section to said interconnecting intermediate halogenation section;

g. introducing steam and halogen or a halogen-containing compound to said intermediate halogenation section through a halogen-steam inlet port and therein increasing the halogen content of the catalyst particles;

h. introducing the catalyst particles of increased halogen content to said interconnecting lower drying section;

i. introducing a second air steam from an external source to said lower drying section through a lower drying section inlet port, wherein substantially all the water from said catalyst particles of increased halogen content in said lower drying section is removed, and wherein the mole ratio of air in said first air stream of (b) and said second air stream is at least 1.0:1.0;

j. withdrawing the substantially water-free regenerated catalyst particles from the lower end of the regeneration zone through a catalyst particle withdrawal conduit; and,

k. wherein in said method of regenerating said first air stream, second air stream and steam and halogen or halogen-containing compound are introduced transversely and flow countercurrently to said gravitational flow of said catalyst particles, and wherein air from the lower drying section passes upwardly therefrom into the halogenation section and therethrough into the carbon burning section.

3,981,825
HYDROCARBON CONVERSION CATALYST

William J. Reagan, Yardley, Pa., and Nai Y. Chen, Titusville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed June 7, 1974, Ser. No. 477,240
Int. Cl.² B01J *21/04, 21/12, 23/42, 23/52*
U.S. Cl. 252—455 R **8 Claims**

1. A reforming catalyst comprising a solid porous support containing platinum, iridium and gold, said catalyst being prepared by the process of applying to the said support a dimethylsulfoxide solution containing soluble compounds of the metals, selected from the group consisting of metal salt, metal acid, metal ammine and metal ammine halide, drying the resulting solids and calcining.

3,981,826
HARD SURFACE CLEANING COMPOSITION

Hamish David Munro, St. Albans, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 304,868, Nov. 8, 1972, abandoned. This application Nov. 25, 1974, Ser. No. 526,647
Claims priority, application United Kingdom, Nov. 15, 1971, 52874/71
Int. Cl.² C11D *1/12, 3/04, 3/12*
U.S. Cl. 252—526 **16 Claims**

1. A substantially non-aqueous liquid, pasty or gelatinous detergent composition having scouring properties comprising a dispersion of from about 19% to 79% of a water-miscible liquid medium selected from the group consisting of

a. a liquid polyhydric alcohol and

b. a mixture of a liquid polyhydric alcohol and a lower monohydric alcohol,

wherein the amount of free water is not more than about 5% by weight and;

a. from about 15 to 74% of a normally solid watersoluble anionic surface-active agent selected from the group consisting of alkali metal, ammonium, and amine salts of organic sulfates and sulfonates;

b. from about 5 to 60% of a solid particulate watersoluble abrasive inorganic salt selected from the group consisting of chlorides, sesquicarbonates, sulfates, phosphates, carbonates, and borates, said inorganic salt having a particle size such that at least 90% by weight passes an 8 mesh Standard Test Sieve and is retained by a 100 mesh BS Standard Test Sieve, and

c. from about 1 to about 5% by weight of a highly voluminous oxide suspending agent selected from the group consisting of silicas, magnesias, aluminas, clays and mixtures thereof effective to suspend said water-soluble inorganic salt throughout said composition.

3,981,827
POLYURETHANES CONTAINING BROMINATED CYCLOALIPHATIC ESTER POLYOLS

Anthony Joseph Papa, St. Albans, W. Va., and William Robert Proops, Wilmington, Del., assignors to Union Carbide Corporation, New York, N.Y.

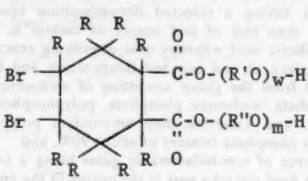
Division of Ser. No. 231,751, March 3, 1972, Pat. No. 3,869,502. This application Nov. 26, 1974, Ser. No. 527,431

Int. Cl.² C08G *18/14, 18/42*

U.S. Cl. 260—2.5 AN **16 Claims**

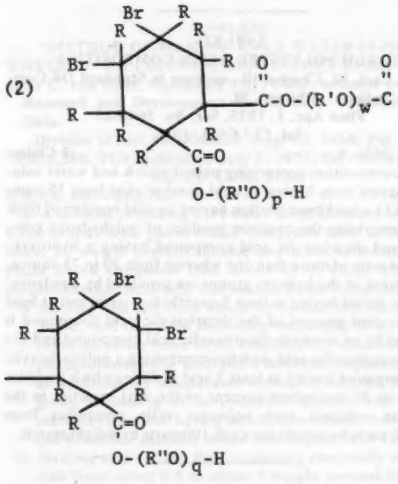
1. A method for producing flame-retarded cellular polyurethanes which comprises reacting and foaming a reaction mixture containing: (a) an organic polyisocyanate, (b) a mixture of bromine-substituted cycloaliphatic ester polyols, (c) a polyol different from said mixture of bromine-substituted cycloaliphatic ester polyols (b), and (d) a blowing agent, wherein the bromine-substituted cycloaliphatic ester polyols contained in said mixture thereof have the formulas,

(1)



and

(2)



wherein R is hydrogen or an alkyl radical having from 1 to 6 carbon atoms; each of R′ and R″ is a bivalent alkylene group having from 2 to 10 carbon atoms; *w* is a number having an average value of from about one to about 15; and *m*, *p* and *q* are positive numbers provided the average value of the sum *m+p+q* is between about one and about 10.

3,981,828
FLEXIBLE CELLULAR POLYURETHANE FOAM COMPOSITIONS HAVING INCREASED FLAME RETARDANCE

John G. Demou, Lincoln Park; Louis C. Pizzini, Trenton, and John T. Patton, Jr., Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 264,157, June 19, 1972, Pat. No. 3,804,782. This application Apr. 12, 1974, Ser. No. 460,441

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C08G *18/14, 18/18, 18/20*

U.S. Cl. 260—2.5 AC **8 Claims**

1. A flexible polyurethane foam prepared in the presence of water by the reaction of:

a. a polyalkylene polyether polyol having an average equivalent weight of from 200 to 2500 with

b. an organic polyisocyanate employing an isocyanate index of from 130 to 225 in the presence of from 0.05 part to 10 parts by weight per 100 parts by weight of said polyalkylene polyether polyol of an isocyanate trimerization catalyst selected from the group consisting of triethylene diamine, alkylene oxide-water adducts of triethylene diamine, triethylene diamine diformate, and N-benzyltrialkyl ammonium alkoxides and hydroxides.

3,981,829
PROCESS FOR THE PREPARATION OF CARBODIIMIDE-ISOCYANURATE FOAMS

Moses Cenker, Trenton; Thirumurti L. Narayan, Riverview, and Peter T. Kan, Plymouth, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 30, 1974, Ser. No. 537,102

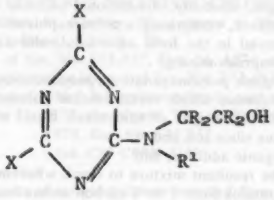
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C08G *18/14, 18/20*

U.S. Cl. 260—2.5 AC **9 Claims**

1. A process for the preparation of a foam characterized by carbodiimide and isocyanurate linkages which comprises condensing an organic polyisocyanate in the presence of a catalyst system comprising based on 100 parts by weight of organic polyisocyanate

a. from 0.1 part to 10 parts by weight of an s-triazine compound selected from the group consisting of 2,4,6-tris(-diethanolamino)-s-triazine, 2,4,6-tris(diisopropanolamino)-s-triazine, 2,4,6-tris(dibutanolamino)-s-triazine, 2,4,6-tris(N-methylethanolamino)-s-triazine, and unsymmetrically substituted triazines of the formula:



wherein R is hydrogen or lower alkyl of from 1 to 10 carbon atoms, R^1 is CR_2CR_2OH or lower alkyl of from 1 to 12 carbon atoms, X is NR_2, alkoxy of from 1 to 12 carbon atoms, phenoxy, alkyl of from 1 to 12 carbon atoms, phenyl, hydroxyl, halogen, aziridyl, pyrrolidyl, piperidyl, or N-alkylpiperazyl,

b. from 1 part to 6 parts by weight of a 1,3,5-tris(N,N-dialkylaminoalkyl)-s-hexahydrotriazine or the alkylene oxide and water adducts thereof, and

c. from 0.01 part to 5 parts by weight of a phenolic compound selected from the group consisting of phenol, methylphenols and halophenols.

3,981,830

PROCESS FOR PRODUCING CHEMICALLY CROSSLINKED POLYETHYLENE-POLYBUTADIENE

Yasumasa Takeuchi; Takehiko Ikeda, both of Yokohama; Akira Sekimoto, Kamakura; Takashi Hayashi, Gifu; Toshimi Sasaki, and Sabulo Atsumi, both of Anjo, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd. and MTP Kasei Co., Ltd., both of, Japan

Continuation of Ser. No. 428,637, Dec. 26, 1973, abandoned. This application June 27, 1975, Ser. No. 590,910
Claims priority, application Japan, Dec. 30, 1972, 48-3203
Int. Cl.² C08J *9/00*
U.S. Cl. 260—2.5 HA **14 Claims**

1. A process for producing a chemically cross-linked polyethylene foam comprising heating a composition consisting essentially of at least one polyethylene, at least one blowing agent, and at least one crosslinking agent to simultaneously foam and cross-linked said composition, wherein said composition further contains 1,2-polybutadiene having a 1,2-addition unit content of at least 70%, a crystallinity of 10 to 30% and an intrinsic viscosity of at least 0.7 dl/g as measured in toluene at 30°C and the ratio of said, 1,2-polybutadiene to the polyethylene is 3 to 50% by weight of the former to 97 to 50% by weight of the latter.

3,981,831

INORGANIC-ORGANIC PLASTIC

Peter Markusch, Cologne; Dieter Dieterich, Leverkusen, both of Germany, and Helmut Reiff, New Martinsville, W. Va., assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 26, 1974, Ser. No. 527,474
Claims priority, application Germany, Nov. 30, 1973, 2359612
Int. Cl.² C08G *18/14, 18/30, 3/34*
U.S. Cl. 260—2.5 AM **17 Claims**

1. A process for producing an inorganic-organic plastic of high strength, elasticity, dimensional stability to heat, and flame resistance, comprising a polyureapolysilicic acid composite material in the form of a solid/solid xerosol, which process comprises mixing:

A. an organic polyisocyanate or polyisothiocyanate;

B. an aqueous alkali metal silicate solution containing 20–70% by weight of said alkali metal silicate, or an aqueous silica sol, and

C. an organic additive, and

allowing the resultant mixture to react, wherein said organic additive contains from 1 to 9 carbon atoms has a molecular weight of from 32 to 400 and is selected from the group consisting of monoalcohols, monothioalcohols, monophenols, monothiophenols, halomethyl group containing compounds, nitriles, esters, ethers, thioethers, ketones, nitro-group containing compounds, monocarboxylic acid chlorides, monocarboxylic acid bromides, monosulphonic acid chlorides, monocarboxylic acids or salts thereof, monosulphonic acids or salts thereof, and aldehydes, with the proviso that when said organic additive is a monoalcohol, monothioalcohol, monophenol, monothiophenol or monocarboxylic acid, said mixing of (A), (B) and (C) takes place substantially simultaneously.

3,981,832

FIRE-PROTECTING EPOXY RESINS

Leo M. Godfried, Badhoevedorp, Netherlands, assignor to Fokker-V.F.W. B.V., Schiphol-Oost, Netherlands

Division of Ser. No. 220,431, Jan. 24, 1972, Pat. No. 3,839,239. This application July 12, 1974, Ser. No. 488,007
Claims priority, application Netherlands, Feb. 11, 1971, 7101806
Int. Cl.² C08J *9/02;* **C08G** *53/08*
U.S. Cl. 260—2.5 EP **3 Claims**

1. A fire-protecting epoxy resin, essentially comprising a cured product of an epoxy resin made from a polyfunctional halohydrin and a polyhydric phenol and cured with a curing agent selected from the group consisting of polyamines and carboxylic anhydrides, said cured epoxy resin having a source of carbon, a source of phosphoric acid and a source of non-inflammable gases incorporated therein throughout its mass,

said source of carbon having a high temperature of decomposition and containing many radicals capable of entering into an esterifying reaction with phosphoric acid, said carbon source being polyvalent alcohol,

said source of phosphoric acid being a phosphate compound having a selected decomposition temperature lower than that of said source of carbon to generate phosphoric acid whereby said esterifying reaction may take place at said selected temperature and being selected from the group consisting of ammonium orthophosphate, melamine phosphate, polyphosphoryl phosphate, and water-insoluble ammonium polyphosphate with a phosphate content of about 90%, and

said source of non-inflammable gases being a compound which does not take part in the curing of the epoxy resin but remains in free state therein and provides non-inflammable gases at temperatures above said selected temperature and said source of non-inflammable gases being selected from the group consisting of dicyanodiamide, urea, melamine, guanidine and a combination thereof with chlorinated paraffin,

and said fire-protecting epoxy resin further comprising a glass fiber reinforcement.

3,981,833

STARCH/POLYESTER RESIN COMPOSITION

John C. Lark, St. Charles, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 1, 1975, Ser. No. 564,025
Int. Cl.² C08L *3/00*
U.S. Cl. 260—9 **5 Claims**

1. A composition comprising pasted starch and water soluble polyester resin having an acid number of at least 35 comprising (1) a backbone portion having an acid number of from 0–25 comprising the reaction product of polyhydroxy compound and dicarboxylic acid compound having a hydroxyl:carboxyl ratio of more than one wherein from 20 to 75 equivalent percent of the hydroxy groups are provided by a polyoxyethylene glycol having at least 3 oxyethylene units and at least 50 equivalent percent of the dicarboxylic acid compound is provided by an aromatic dicarboxylic acid compound and (2) pendant carboxylic acid moieties comprising a polycarboxylic acid compound having at least 3 acyl moieties which provides from 5 to 30 equivalent percent of the acyl moieties in the polyester, wherein said polyester resin comprises from 0.1–100 parts by weight per each 100 parts by weight starch.

3,981,834

CONCRETE TREATING COMPOSITION

Larry J. Kern, 1848 S. Stuart, Denver, Colo. 80219, and John D. Webb, 2972 S. Vrain, Denver, Colo. 80236

Filed Dec. 30, 1974, Ser. No. 537,335
Int. Cl.² C08L *1/26*
U.S. Cl. 260—17 R **14 Claims**

1. A water base emulsion for use as a film-forming agent for

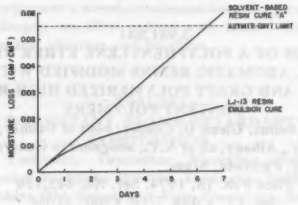
treating concrete before it has set comprising the following ingredients with amounts given in weight percents:

about 50–60 percent water,

about 15–35 percent of a polydicyclopentadiene having a molecular weight range of about 650–950,

about 0.5–2.5 percent of a higher fatty acid, having about 10 to 20 carbon atoms in the alkyl chain

LJ-13 RESIN EMULSION MOISTURE RETENTION PERFORMANCE VS. THAT OF A TYPICAL SOLVENT-BASED RESIN CURE



about 10–15 percent of an organic solvent for the higher fatty acid,

about 0.1–1 percent of an alkaline hydroxide selected from the group consisting of ammonium hydroxide and alkali metal hydroxides,

about 0.5–2.5 percent of a nonionic surfactant, and

about 0.1–1 percent of a thixotropic agent.

3,981,835

METHOD OF MAKING A SET WATER-IN-OIL EMULSION INCLUDING A CONTINUOUS RESIN PHASE

John C. van Dyke, Oklahoma City, Okla., assignor to Woods Research and Development Corporation, Oklahoma City, Okla.

Division of Ser. No. 850,629, Aug. 15, 1969, Pat. No. 3,635,289. This application July 1, 1971, Ser. No. 159,002

Int. Cl.² C08L *51/08*

U.S. Cl. 260—29.6 NR **9 Claims**

1. A method of making a set water-in-oil emulsion including a continuous resin phase which comprises from about 40 to about 20 weight percent thereof and a discontinuous water phase which comprises from about 60 to about 80 weight percent thereof from first and second fluids comprising:

a. forming said first fluid which forms said continuous resin phase, said first fluid consisting essentially of an unsaturated polyester resin of an ethylenically unsaturated aliphatic dicarboxylic acid and a saturated aliphatic glycol, an ethylenically unsaturated monomer selected from the group consisting of acrylonitrile, styrene, and methyl methacrylate, and having an effective amount of a catalyst promoter therefor mixed thoroughly therewith;

b. forming said second fluid consisting essentially of water with from about 0.5 to about 5 weight percent based on the total weight of said first and second fluids of a nonionic colloidal suspension agent thoroughly admixed therein, and an effective amount of a catalyst for said polymerizable component, thoroughly admixed therein; and

c. thoroughly admixing said first and second fluids to form an emulsion and allowing said emulsion to set to form said set water-in-oil emulsion.

3,981,836

YARN SIZES, SIZING TREATMENTS AND RESULTING SIZED YARNS

James C. Pangle, Jr., Danville, Va., and Alton D. Hicks, Mauldin, S.C., assignors to Dan River Inc., Danville, Va.

Division of Ser. No. 744,292, July 12, 1968, Pat. No. 3,630,983, which is a continuation-in-part of Ser. Nos. 407,551, Oct. 29, 1964, abandoned, and Ser. No. 491,399, Sept. 29, 1965, and Ser. No. 670,787, Sept. 26, 1967. This application Sept. 3, 1971, Ser. No. 177,827

Int. Cl.² D06M *15/14*

U.S. Cl. 260—29.6 H **8 Claims**

1. A textile size composition dispersible in water comprising a mixed salt of a styrene-maleic anhydride copolymer, 20 to 80 weight percent of the cations of said salt being ammonium cations and 20 to 80 weight percent of said cations being alkali metal cations.

3,981,837

LARGE PARTICLE SIZE SYNTHETIC LATEX EMULSIFIERS

John G. Papalos, Kearny, and James S. Lee, Long Valley, both of N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation of Ser. No. 334,849, Feb. 22, 1973, abandoned. This application Mar. 22, 1974, Ser. No. 453,924

Int. Cl.² C08F *2/26;* **C08L** *9/04, 9/08, 27/06*

U.S. Cl. 260—29.7 SQ **16 Claims**

1. In the process of manufacturing synthetic latexes, using a recipe containing a diluent, an emulsifier, an initiator, and at least one relatively water insoluble latex monomer, with optionally, a chelating agent, an electrolyte, a chain transfer agent, and a secondary emulsifier, the improvement comprising forming large particle size latexes by using in the recipe from about 0.5 to 4.0 parts by weight, based on 100 parts by weight of latex monomers, of a primary emulsifier system comprising

a. from about 35 to about 87% by weight of a salt of a mono-alkyl benzene mono-sulfonate, and

b. the balance being mono-alkyl benzene wherein the alkyl moiety is linear, saturated or unsaturated and has from about 6 to about 20 carbon atoms.

3,981,838

LUBRICANT FOR POLYVINYL CHLORIDE

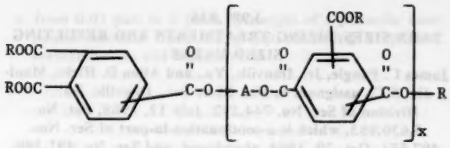
Alfred P. Wilson, St. Charles, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 515,437, Oct. 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 373,482, June 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 373,481, June 25, 1973, abandoned. This application Nov. 28, 1975, Ser. No. 635,851

Int. Cl.² C08K *5/12*

U.S. Cl. 260—31.6 **7 Claims**

1. In extrusion of a rigid polymer selected from the group consisting of vinyl chloride polymer, vinyl chloride-vinyl acetate copolymer, acrylonitrile-butadiene-styrene terpolymer and methylmethacrylate-butadiene-styrene terpolymer, whereby the polymer is forced through an orifice to produce a continuously formed profile, the improvement comprising adding to the polymer before extrusion an effective internal and external lubricating amount of up to 4 phr of a reaction product of (a) trimellitic acid, trimellitic anhydride or a mixture thereof and (b) a dihydric alcohol, in a molar ratio between 1.6 to 1 and 4.0 to 1, and (c) one or more aliphatic mono alcohols, such product having the formulae:



wherein such product comprises a mixture of a plurality of species with $x = 0$, 1, 2, 3 or 4 and where A is an aliphatic diradical containing 2 to 10 carbon atoms, R is individually selected from the group consisting of alkyl radicals containing 16 to 35 carbon atoms and hydrogen.

3,981,839

PROCESS FOR THE PREPARATION OF POLYMER DISPERSIONS

Brian Roy Asher, Egham, and Morice William Thompson, Maidenhead, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 12, 1974, Ser. No. 478,831

Claims priority, application United Kingdom, June 18, 1973, 28837/73

Int. Cl.² C08J *3/02*; **C08K** *5/01*, *5/02*, *5/05*

U.S. Cl. 260—33.6 R **10 Claims**

1. A process for the preparation of a dispersion of a condensation polymer, in which the links between the reactants forming the polymer chain involve atoms other than carbon and in the formation of which a low molecular weight by-product is eliminated, in a first liquid medium selected from the group consisting of hydrocarbons and chlorinated hydrocarbons in which the polymer is insoluble, the process comprising heating in the said first liquid medium, at a temperature of at least 150°C, an appropriate polymer-forming reactant or reactants, said first liquid having a boiling point not lower than the temperature at which the polymer is formed and the reactant or at least one of the reactants being insoluble therein, each said insoluble reactant being dissolved at a concentration of from 10% to 90% by weight in a second liquid which is inert towards the polymer-forming reaction, is substantially immiscible with the first liquid at the temperature of the said reaction and is capable of being separated from the first liquid by distillation, and the solution of the reactant in the second liquid being present as the liquid disperse phase of an emulsion of which the continuous phase is the first liquid, the polymerization taking place in the disperse phase which constitutes from 10% to 75% by volume of the total emulsion, and wherein there is present, in an amount of from 1% to 10% by weight of the said disperse phase, an emulsifying agent which has at least one polymeric component soluble in the said continuous phase and at least one other polymeric component soluble in the said disperse phase, one of the polymeric components of the emulsifying agent which is soluble in the said disperse phase being also capable of sufficient association with the polymer produced for the preparation of a stable, finely divided polymer dispersion.

3,981,840

METHOD FOR MOLDING THERMOPLASTIC RESIN COMPOSITIONS

Sadanori Yamamoto, and Isao Osada, both of Hirakata, Japan, assignors to Joto Chemical Company Limited, Japan

Continuation-in-part of Ser. No. 257,720, May 30, 1972, abandoned. This application Mar. 13, 1974, Ser. No. 450,797

Claims priority, application Japan, June 3, 1971, 46-38230

Int. Cl.² C08K *9/00*

U.S. Cl. 260—42 **7 Claims**

1. Process for manufacture of shaped articles by molding a thermoplastic resin composition and a filler which comprises (1) preheating the filler to a preheating temperature at which the filler has an amount of heat sufficient for heating the resin to its melting point and which is about 50° to about 200°C higher than the melting point of the thermoplastic resin, (2) mixing and heating thermoplastic resin with the filler in a true volume ratio of resin to filler between about 1 to 0.5 and about 1 to 1.5, controlling said preheating temperature of the filler being limited to a temperature T_2 which is defined by the relation $W_1C_1(T_M-T_1) = W_2C_2(T_2-T_M)$ wherein W_1 and W_2 are the respective weights of resin and filler in one mixture, C_1 and C_2 are the respective specific heats of the resin and filler, T_1 is the temperature of the resin, and T_M is the melting point of the resin, and (3) subsequently kneading the resultant mixture of resin and filler under pressure, and then molding the resultant mixture to form the desired shaped article.

3,981,841

BLENDS OF A POLYPHENYLENE ETHER RESIN, ALKENYL AROMATIC RESINS MODIFIED WITH EPDM RUBBER AND GRAFT POLYMERIZED HIGH RUBBER CONTENT POLYMERS

Visvaldis Abolins; Glenn D. Cooper, both of Delmar, and Gim F. Lee, Jr., Albany, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Feb. 15, 1974, Ser. No. 443,150

Int. Cl.² C08K *7/14*; **C08L** *51/04*

U.S. Cl. 260—42.18 **11 Claims**

1. A thermoplastic molding composition which comprises:

a. from 20–65% by weight of a polyphenylene ether resin;

b. from 25–70% by weight of an alkenyl aromatic resin that is modified with from 5 to 20% by weight of a rubbery interpolymer which comprises 10–90 mole percent of ethylene, 10–90 mole percent of an alpha olefin having from 3–10 carbon atoms and from 0.1–10 mole percent of a polyene that is a non-conjugated cyclic or open-chain diene that has from 5–10 carbon atoms; and

c. from 5–20% by weight of an emulsion graft copolymer of from 40–70 parts by weight of an alkenyl aromatic resin and from 30 to 60 parts by weight of a rubbery interpolymer which comprises 10–90 mole percent of ethylene, 10–90 mole percent of an alpha olefin having from 3–10 carbon atoms and from 0.1–10 mole percent of a polyene that is a non-conjugated cyclic or open-chain diene that has from 5–10 carbon atoms.

3,981,842

SUBSTANTIALLY NON-INFLAMMABLE ACRYLONITRILE POLYMERS CONTAINING ANTIMONY SALTS

Eduard Radlmann, Dormagen-Hackenbroich; Heinz Schaffner, Dormagen; Günter Lorenz, Dormagen, and Günther Nischk, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 8, 1975, Ser. No. 575,591

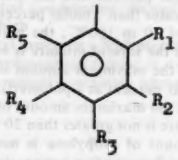
Claims priority, application Germany, May 8, 1974, 2422171

Int. Cl.² C08J *3/20*

U.S. Cl. 260—45.75 B **5 Claims**

1. A composition of matter which comprises a copolymer of acrylonitrile and a member selected from the group consisting of vinyl halide, vinylidene halide and a mixture thereof and from 0.1 to 5% by weight based on the total mixture of antimony in the form of a water-insoluble complex antimony compound containing at least one amide group which compound is formed by reacting an antimony oxide of Sb to acid in a molar ratio of 1:2 to 1:4 with an α-hydroxy carboxylic acid selected from the group consisting of tartaric acid, malic acid, lactic acid, glycolic acid, citric acid, mucic acid and glyceric acid in a polar organic solvent at a temperature in the range of from 100 to 200°C, and reacting the resulting reaction product with the stoichiometric quantity of a monoisocyanate at a temperature below 100°C, said monoisocyanate corresponding to the general formula R—N=C=O, wherein R is a

linear or branched alkyl radical with from 1 to 20 carbon atoms, or represents the radical:



in which R_1, R_2, R_3, R_4 and R_5 which may be identical or different, represent a member selected from the group consisting of hydrogen, an alkyl radical with from 1 to 5 carbon atoms, fluorine, chlorine and bromine.

3,981,843

IMPACT-RESISTANT, FLAME-RETARDANT RESIN COMPOSITION

Hiroyuki Yoshizaki, Toyonaka; Hiromitsu Takanohashi, Takarazuka; Yoshitaka Masuda, Toyonaka; Yukio Hozumi, Sakai; Akira Ohi, Sakai, and Yuzo Sonoyama, Sakai, all of Japan, assignors to Daicel, Ltd., Osaka and Mitsubishi Gas Chemical Company, Inc., Tokyo, both of, Japan

Filed Sept. 27, 1974, Ser. No. 510,047

Claims priority, application Japan, Sept. 28, 1973, 48-109575

Int. Cl.² C08K *5/59;* **C08L** *67/06*

U.S. Cl. 260—45.75 B **8 Claims**

1. An impact-resistant, flame retardant, blended resin composition in which the resin components of said composition consist essentially of a mixture of

A. from 15 to 85 weight percent of ABS resin,

B. from 15 to 85 percent by weight of a high molecular weight aromatic polycarbonate copolymer prepared from a mixture of bisphenols consisting essentially of from 5 to 50 weight percent of nuclear-halogen-substituted bisphenol and the balance is an unsubstituted bisphenol,

and an inorganic or organic antimony flame-retardant compound in an amount of from 0.3 to 5 parts by weight per 100 parts by weight of the resin mixture.

3,981,844

STABLE EMULSION AND METHOD FOR PREPARATION THEREOF

Lubomyr T. Romankiw, Briarcliff Manor, N.Y., assignor to IBM, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 591,981

Int. Cl.² H01F *1/00*

U.S. Cl. 252—62.52 **18 Claims**

1. An emulsion having a continuous and discontinuous phase comprising:

A. water;

B. a water-immiscible organic liquid phase comprising a solution of:

1. a liquid nonpolar hydrocarbon selected from the group consisting of aliphatic hydrocarbons, aromatic hydrocarbons, and mixtures thereof; and

2. a liquid halogenated aliphatic hydrocarbon;

C. a colloidal suspension in the discontinuous or continuous phase of the emulsion of ferromagnetic particles and a surface-active agent in an amount at least sufficient to stabilize the ferromagnetic particles in the desired discontinuous or continuous phase of the emulsion;

D. the relative proportions of said nonpolar hydrocarbon and said halogenated aliphatic hydrocarbon being such that the density of the water phase and the density of the water-immiscible liquid phase are substantially equal to each other; and

E. said nonpolar hydrocarbon and said halogenated aliphatic hydrocarbon being mutually soluble in each other and being compatible with said surface-active agent.

3,981,845

HIGH SURFACE AREA POLYCONDENSATION POLYMER PARTICULATES BASED ON UREA AND FORMALDEHYDE

Alfred Renner, Muenchenstein, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 442,901, Feb. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 380,127, July 17, 1973, abandoned, which is a continuation of Ser. No. 275,658, July 27, 1972, abandoned, which is a continuation-in-part of Ser. Nos. 102,170, Dec. 28, 1970, abandoned, and Ser. No. 83,624, Oct. 23, 1970, abandoned, said Ser. No. 102,170, is a division of Ser. No. 389,197, Aug. 12, 1964, abandoned, and Ser. No. 775,964, Nov. 14, 1968, Pat. No. 3,553,115, which is a continuation-in-part of Ser. No. 807,926, March 17, 1969, abandoned. This application May 27, 1975, Ser. No. 580,792

Claims priority, application Switzerland, Aug. 23, 1963, 10437/63; Mar. 21, 1968, 04169/68

Int. Cl.² C08G *12/12*

U.S. Cl. 260—69 R **5 Claims**

1. An insoluble, infusible, finely dispersed, non-porous urea-formaldehyde condensation product in particulate form having a specific surface area of more than 10 m^2/g and an average particle size smaller than 5 microns.

3,981,846

WORKABLE AND THERMAL STABLE INTERPOLYMERS OF DICARBOXYLIC ACID ESTERS AND VINYL CHLORIDE

Johannes Freytag, Troisdorf-Siegler, and Hans-Ewald Konermann, Troisdorf-Oberlar, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation of Ser. No. 139,140, April 30, 1971, abandoned. This application June 29, 1973, Ser. No. 375,210

Claims priority, application Germany, May 5, 1970, 2021938; June 2, 1970, 2026821

Int. Cl.² C08F *15/32, 45/58*

U.S. Cl. 526—227 **4 Claims**

1. Vinyl chloride resin having good workability and formable into articles having high thermal stability which comprises:

a. vinyl chloride polymer which is a copolymer of vinyl chloride and cetyl alcohol diester of at least one of fumaric acid and maleic,

b. additives including

1. a plasticizer, and

2. an organic peroxide cross-linking agent having a starting temperature above 150°C.

3,981,847

PROCESS FOR THE PRODUCTION OF POLYAMIDOCARBOXYLIC ACIDS

Gerhard Meyer; Anton Toth, both of Obernburg, and Dieter Laudien, Wuppertal, all of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Nov. 7, 1974, Ser. No. 521,848

Claims priority, application Germany, Nov. 16, 1973, 2357297

Int. Cl.² C08G *73/10*

U.S. Cl. 260—78 TF **9 Claims**

1. In a process for the production of a polyamic acid as the prepolymer in the formation of a polyimide by the reaction of approximately equimolar amounts of a tetracarboxylic acid dianhydride with a diprimary diamine at a temperature below about 50°C. and under substantially water-free conditions in an anhydrous, polar, aprotic organic solvent, the improvement which comprises:

first treating the dianhydride reactant in the form of solid fine particles by adding thereto a limited amount of a solvent, using (a) an inert organic solvent in an amount sufficient only to wet said dianhydride or (b) a polar, aprotic organic solvent in an amount at least sufficient to wet said dianhydride up to an amount which forms the dianhydride into a paste or suspension; and

then adding a solution of said diamine in the polar, aprotic organic solvent continuously or in portions to the thus treated dianhydride under thorough mixing.

3,981,848

PHOTOCONDUCTIVE COMPOSITIONS AND IMAGING MEMBERS AND METHODS EMPLOYING SAME

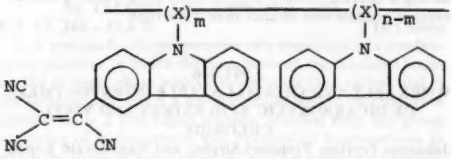
William W. Limburg, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 374,187, June 27, 1973, abandoned. This application Feb. 20, 1974, Ser. No. 444,215

Int. Cl.² C08F *22/30, 26/12*

U.S. Cl. 526—263 5 Claims

1. A photoconductive polymer of the formula



wherein

X is a structural unit of the backbone of the photoconductive polymer;

n is the total number of N-carbazyl groups pendant from the backbone of the photoconductive polymer; and

m is at least 0.1 percent of the number of N-carbazyl functional groups pendant from the backbone of the photoconductive polymer.

3,981,849

LOW PRESSURE PROCESS FOR THE PRODUCTION OF LOW DENSITY CO- AND TERPOLYMERS OF ETHYLENE

Albert Frese; Fritz Baxmann, and Walter Dittmann, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Oct. 2, 1974, Ser. No. 511,130

Claims priority, application Germany, Oct. 5, 1973, 2350065

Int. Cl.² C08F *10/02, 10/06, 10/08*

U.S. Cl. 526—82 12 Claims

1. In a process for the production of low density thermoplastic ethylene copolymers by low pressure copolymerization of ethylene with 0.1 to 20 molar percent of an α-olefin comonomer selected from the group consisting of propylene, butene-1 and mixtures thereof with a particulate mixed polymerization catalyst consisting essentially of (a) titanium trichloride and (b) a trialkylaluminum or a dialkylaluminum hydride in a molar ratio Al:Ti of 0.5 – 4.0, the improvement which comprises conducting the polymerization as a liquid phase solution polymerization employing a polymerization solvent consisting essentially of C_4 or a mixture of C_3 and C_4 hydrocarbons containing 0.1–20 molar percent of said α-olefin, 1–60 molar percent of butane, propane or mixtures thereof and 20–98.0 molar percent of butene-2 to form said copolymer product substantially free of homopolymers, provided that the maximum amount of butene-1 present in the solvent mixture is not greater than 5 molar percent and the maximum amount of propylene is not greater than 3 molar percent at a polymerization temperature of 70 to 100°C.; the maximum amount of butene-1 present in the solvent mixture is not greater than 10 molar percent and the maximum amount of propylene is not greater than 5 molar percent at a polymerization temperature of 50 to 70°C.; and the maximum amount of butene-1 present in the solvent mixture is not greater than 20 molar percent and the maximum amount of propylene is not greater than 15 molar percent at a polymerization temperature of 20°to 50°C.

3,981,850

PROCESS FOR PREPARING COPOLYMERS OF ETHYLENE AND VINYL ESTERS OR MIXTURES WITH OTHER ETHYLENICALLY UNSATURATED MONOMERS

Max J. Wisotsky, Highland Park, and Norman Tunkel, Perth Amboy, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 158,615, June 30, 1971, abandoned, which is a continuation of Ser. No. 808,040, March 12, 1969, abandoned, which is a continuation-in-part of Ser. No. 717,902, April 1, 1968, abandoned. This application Aug. 19, 1975, Ser. No. 605,901

Int. Cl.² C08F *210/02*

U.S. Cl. 526—227 3 Claims

1. A method of copolymerizing about 3 to 20 molar proportions of ethylene per molar proportion of vinyl acetate to form a pour depressant copolymer having less than 6 methyl terminating side branches per 100 methylene groups and having a molecular weight of about 1,000 to 2,900, which comprises copolymerizing said ethylene and vinyl acetate in cyclohexane as solvent at a temperature of about 70° to 130°C. using dilauroyl peroxide catalyst and under pressure of 500 to 3,000 psi.

3,981,851

PRIMER COMPOSITIONS

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 216,769, Jan. 10, 1972, Pat. No. 3,808,018. This application Nov. 19, 1973, Ser. No. 417,014

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

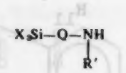
Int. Cl.² C08F *212/08*

U.S. Cl. 526—267 8 Claims

1. A composition consisting essentially of

a. 80 to 99.99 weight percent of a tackifier component consisting essentially of a resin having a molecular weight of no more than 12,000, said resin being selected from the group consisting of polyterpenes, coumarone-indene resins and modified coumarone-indene resins, polycyclopentadiene, aliphatic hydrocarbon resins and chlorinated aliphatic hydrocarbon resins having a ring and ball softening temperature of from 50° to 120°C., said aliphatic resins being derived from olefinic monomers having 3 to 5 inclusive carbon atoms; polystyrene and copolymers of styrene with at least one ethylenically unsaturated aromatic monomer, phenolic and modified phenolic resins and chlorinated terphenyl or diphenyl resins having a chlorine content of about 42 to 65 weight percent; and

b. 0.01 to 20 weight percent of an organosilicon compound of the general formula



water-soluble partial condensates thereof and hydrochloride salts thereof in which

X is the hydroxyl group or a hydrolyzable radical;

Q is a divalent hydrocarbon radical or a substituted divalent hydrocarbon radical containing nitrogen in the form of

groups wherein R is a hydrogen atom, a lower alkyl group containing from 1 to 6 inclusive carbon atoms or a phenyl radical; and

R′ is selected from the group consisting of the hydrogen atom, monovalent hydrocarbon radicals containing from 1 to 18 inclusive carbon atoms and substituted monovalent hydrocarbon radicals containing oxygen in the form of —COC or

and having from 1 to 18 inclusive carbon atoms.

3,981,852

POLYTETRAFLUOROETHYLENE MOLDING POWDER

Carl Harding Manwiller, Wilmington, Del., and Carleton Angelo Sperati, Parkersburg, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 17, 1974, Ser. No. 480,142

Int. Cl.² C08F *114/26, 214/26*

U.S. Cl. 526—250 13 Claims

1. Polytetrafluoroethylene molding powder having

a. a specific surface area of at least 1.5 m^2/g,

b. an average particle diameter of less than 100 microns;

c. an apparent density of at least 500 g/l, with the proviso that the apparent density is at least as great as the value calculated from the equation

$$\text{apparent density} = 500 \text{ g/l} + 3.00\ (\Delta SG_{5-1})$$

wherein ΔSG_{5-1} is 1000 times the difference in specific gravities of sintered moldings made at preform pressures of 1000 psi and 5000 psi wherein said ΔSG_{5-1} is no greater than 75,

d. a tensile strength of at least 245 kg/cm^2 at 70 kg/cm^2 preform pressure,

e. a porosity of less than 0.20, and

f. a ΔSG_{5-1} no greater than 75.

3,981,853

POLYTETRAFLUOROETHYLENE MOLDING POWDER FROM POLYTETRAFLUOROETHYLENE FINE POWDER

Carl Harding Manwiller, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Comany, Wilmington, Del.

Filed June 17, 1974, Ser. No. 480,143

Int. Cl.² C08F *114/26, 214/26*

U.S. Cl. 526—255 6 Claims

1. A process for making polytetrafluoroethylene molding powder from polytetrafluoroethylene fine powder obtained from aqueous dispersion polymerization comprising compacting said fine powder at a temperature of about 20° to 30°C. at a pressure of 8000 psi to 50,000 psi and partially decompacting the resultant compact to said molding powder having an average diameter of less than 100 microns.

3,981,854

CHLOROPRENE POLYMER ISOLATION

Thomas James Kelly, Metairie, La., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed June 2, 1975, Ser. No. 582,811

Int. Cl.² C08F *6/22*

U.S. Cl. 528—481 10 Claims

1. In the process of acidifying an alkaline latex of a chloroprene polymer to a pH of about 5.0–6.5 prior to the isolation of said polymer by coagulation on a freeze drum, the improvement of adding to said latex a combination of a strong acid and a weak acid, wherein

the strong acid is selected from the group consisting of oxalic acid and sulfonic acids represented by the formula RSO_3H, where R is (a) a C_6–C_{11} alkyl, or (b) an aryl, alkaryl, or aralkyl group in which the sum of the number of any alkyl carbons plus one-half the number of aryl carbons totals 3–11;

the weak acid is a C_1–C_6 carboxylic acid having a first ionization constant whose negative logarithm, pKa, at 25°C., is about 3.5–5.0; and

the proportion of the strong acid in the combination is about 10–80 mole percent.

3,981,855

REACTOR PROCESS CONDITIONS CONTROL

Max Klein, New Shrewsbury, N.J., assignor to Normac, Inc., Tinton Falls, N.J.

Continuation-in-part of Ser. No. 814,879, March 19, 1969, abandoned, which is a continuation-in-part of Ser. No. 601,148, Dec. 12, 1966, abandoned, which is a continuation-in-part of Ser. No. 460,187, June 1, 1965, abandoned, and a continuation-in-part of Ser. No. 218,596, Jan. 17, 1972, Pat. No. 3,880,771, which is a continuation-in-part of Ser. No. 700,704, Jan. 26, 1968, abandoned, and a continuation-in-part of Ser. No. 106,915, Jan. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 889,332, Dec. 31, 1969, abandoned, which is a continuation-in-part of Ser. No. 515,445, Dec. 21, 1965, abandoned, and a continuation-in-part of Ser. No. 15,935, March 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 488,756, Sept. 20, 1965, abandoned. This application June 26, 1972, Ser. No. 266,469

Int. Cl.² B01J *1/00;* B08B *13/00;* C08F *2/00*

U.S. Cl. 526—63 8 Claims

1. The method of conducting under selected temperature conditions and with agitation a chemical operation which includes agitating a liquid phase under selected temperature conditions, which method comprises enclosing whatever starting materials are involved in the selected operation, which includes agitating a liquid phase under selected temperature conditions, in a liquid-tightly enclosed cylindrical operating zone by a liquid-tightly closeable zone-enclosure which enclosure is a heat conductor and has a greater axial length than diameter and is substantially completely enveloped by a temperature-control fluid-confining zone divided into a plurality of substantially equal control-fluid zonal parts; and agitating said operating zone contents by rotating said enclosed operating zone jointly with said fluid-confining zone end over end about an axis substantially perpendicular to and intersecting its longitudinal axis generally about midway between its ends, while running temperature-control fluid separately through each of said zonal parts under substantially identical flow pattern to provide substantially uniform overall indirect heat transfer between the temperature-control fluid and said operating zone contents.

2. The method as claimed in claim 1, wherein the starting materials involved in it comprise polyvinyl chloride insulation covered copper wire and an organic solvent for said insulation in an amount sufficient to dissolve said insulation, and the operating zone is rotated end over end for a time sufficient to dissolve the insulation from said wire at a temperature below that at which the polyvinyl chloride is degraded.

3. The method of conducting a polymerization under selected temperature conditions and with agitation, which method comprises enclosing the polymerization starting materials including at least one fluid polymerizable monomer and a polymerization catalytically effective amount of a compatible catalyst effective for the polymerization of the monomer, in a liquid tightly-enclosed cylindrical operating zone by a liquid-tightly closeable zone-enclosure which enclosure is a heat conductor and has a greater axial length than diameter and is substantially completely enveloped by a temperature-control fluid-confining zone divided into a plurality of substantially equal control-fluid zonal parts; and agitating said operating zone contents by rotating said enclosed operating zone jointly with said fluid-confining zone end over end about an axis substantially perpendicular to and intersecting its longitudinal axis generally about midway between its ends, while running temperature-control fluid separately through each of said zonal parts under substantially identical flow pattern to provide substantially uniform overall indirect heat transfer between the temperature-control fluid and said operating zone contents.

3,981,856

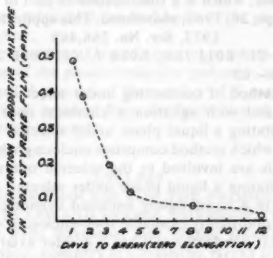
DEGRADABLE HYDROCARBON POLYMERS CONTAINING A METAL COMPOUND AND A BENZOTRIAZOLE

Donald E. Hudgin, Princeton Junction, and Thomas Zawadzki, Princeton, both of N.J., assignors to Princeton Polymer Laboratories, Incorporated, Princeton, N.J.

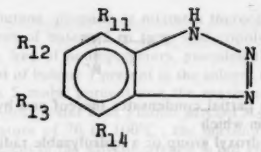
Division of Ser. No. 455,334, March 7, 1974, which is a division of Ser. No. 269,291, July 6, 1972, Pat. No. 3,830,764. This application Jan. 20, 1975, Ser. No. 542,299

Int. Cl.[2] C08J 3/20

U.S. Cl. 526—4 25 Claims



1. A polymeric composition having a controllable degradation rate in sunlight and air comprising (1) a polymer which is a member selected from the group consisting of polymer of an olefin having 2 to 3 carbon atoms and styrene polymers and (2) a two component additive system, the first component of said additive being selected from the group consisting of (a) salts of an organic carboxylic acid with a metal capable of existing in at least two valence states and (b) chelates of a metal capable of existing in at least two valence states with a beta diketone, and the second component of the additive being a benzotriazole of the formula:



wherein R_{11}, R_{12}, R_{13} and R_{14} are selected from the group consisting of hydrogen, halogen alkyl, aryl, alkoxy, aralkyl, aroyl and aryloxy groups, said additive system being present in an amount effective to decrease the time of degradation of the polymer under the influence of ultraviolet light, each of said components of the additive system being present in an amount sufficient that the mixture thereof is more effective to decrease the time of degradation of the polymer than a corresponding amount of either member of the two component additive system by itself.

3,981,857

GELATIN HARDENING PROCESS

Teiji Habu; Hisashi Yamaguchi; Tsuneo Wada; Takashi Sasaki; Hiroki Ishii; Takayoshi Omura, and Hiroyuki Inokuma, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

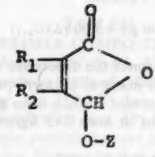
Filed Mar. 18, 1974, Ser. No. 452,374

Claims priority, application Japan, Mar. 19, 1973, 48-30948; Mar. 19, 1973, 48-30949

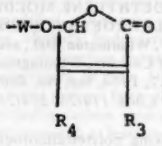
Int. Cl.[2] C09H 7/00

U.S. Cl. 260—117 3 Claims

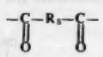
1. A process for hardening photographic gelatin which comprises reacting photographic gelatin with a compound of the general formula



wherein R_1 is selected from the group consisting of halogen, substituted- and unsubstituted- aryloxy and -arylthio, R_2 is halogen, Z is selected from the group consisting of —X—Y and



wherein X is $(C{=}O)_m$, wherein m is 0 or 1, Y is selected from the group consisting of substituted- and unsubstituted- alkyl, -alkenyl and -aryl, W is selected from the group consisting of alkylene,



and $-R_4-(-O_6)_n-$)
wherein
R_5 is selected frm the group consisting of substituted- and unsubstituted- alkylene and -arylene, R_6 is selected from the group consisting of substituted and unsubstituted alkylene, *n* is a positive integer, R_3 is selected from the group consisting of halogen, substituted- and unsubstituted- aryloxy and -arylthio, and R_4 is halogen, provided that when Z is $-X-Y$, R_1 is selected from the group consisting of aryloxy and arylthio.

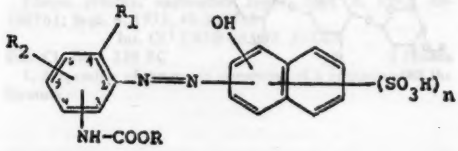
3,981,858

ALKOXY- AND CYCLOHEXYLOXYCARBONYLAMINOPHENYL-AZO-HYDROXYNAPHTHALENES CONTAINING AT LEAST ONE SULFO GROUP

Roland Mislin, Saint-Louis, France, and Hanspeter Uehlinger, Basel, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jan. 15, 1973, Ser. No. 323,621
Claims priority, application Switzerland, Jan. 20, 1972, 823/72
Int. Cl.² C07C *107/04*
U.S. Cl. 260—201 **38 Claims**

1. A compound of the formula



or a salt thereof, wherein
R is alkyl of 6 to 18 carbon atoms, substituted alkyl of 6 to 18 carbon atoms, cyclohexyl or substituted cyclohexyl,
R_1 is hydrogen, halo, alkyl of 1 to 18 carbon atoms, substituted alkyl of 1 to 18 carbon atoms or sulfo,
R_2 is hydrogen, halo, alkyl of 1 to 18 carbon atoms or substituted alkyl of 1 to 18 carbon atoms, and
n is 0, 1 or 2, with the proviso that the compound contains at least one sulfo group,
wherein
each substituent of each substituted alkyl is independently halo, hydroxy, cyano, alkoxy of 1 to 6 carbon atoms, phenyl, substituted phenyl, naphthyl or substituted naphthyl, wherein each substituted phenyl and substituted naphthyl independently has 1 to 2 substituents and each substituent is independently halo, cyano, nitro, hydroxy, trifluoroalkyl of 1 to 6 carbon atoms, trichloroalkyl of 1 to 6 carbon atoms, alkyl of 1 to 6 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, phenyl, naphthyl, alkoxy of 1 to 6 carbon atoms, phenoxy, naphthyloxy, alkoxycarbonyl of 2 to 7 carbon atoms, sulfamoyl, alkylsulfonyl of 1 to 6 carbon atoms, phenylsulfonyl, naphthylsulfonyl, carbamoyl or sulfo,
each substituent of each substituted cyclohexyl is independently alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms or halo, and
each halo is independently fluoro, chloro, bromo or iodo.

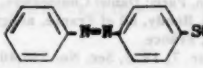
3,981,859

SILICONE-COMPATIBLE AZO DYESTUFFS

Carl Mayn Smith, White Bear Lake, and George Van Dyke Tiers, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 275,190, July 26, 1972, Pat. No. 3,888,891. This application Aug. 28, 1974, Ser. No. 501,211
Int. Cl.² C09B *43/00*
U.S. Cl. 260—205 **1 Claim**

1. An azo dyestuff of the formula:



wherein R^2 is tris(trimethylsilyloxy)silylalkylamino

$$R'-N-R-Si[OSi(CH_3)_3]_3$$

in which R is straight or branched chain unsubstituted alkylene of 1–6 carbon atoms and R′ is hydrogen or unsubstituted lower alkyl of 1 to 6 carbon atoms.

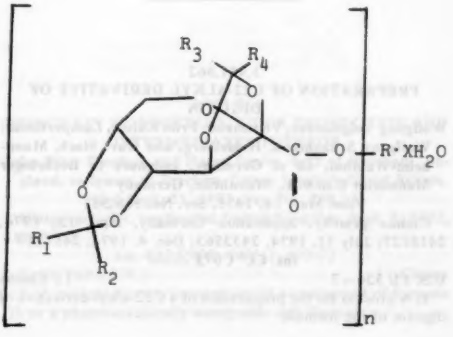
3,981,860

2,3:4,5-DI-O-SUBSTITUTED GLUCONATES

William Szkrybalo, Verona, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 344,657, March 26, 1973, abandoned. This application June 20, 1974, Ser. No. 481,265
Int. Cl.² C07H *9/04*
U.S. Cl. 536—4 **45 Claims**

1. A compound represented by the formula



wherein, when n is 1, R is straight or branched chain alkyl of from 1 to 12 carbon atoms, straight or branched chain lower alkenyl, straight or branched chain lower alkynyl, or halo-lower alkyl and, when n is 2, R is lower alkylene; R_1, R_2, R_3 and R_4 are hydrogen, straight or branched chain lower alkyl, straight or branched chain lower alkenyl, straight or branched chain lower alkynyl, halo-lower alkyl, phenyl, mono-(lower alkoxy) phenyl or R_1 and R_2 together and R_3 and R_4 together are each a saturated ring containing from 3 to 8 carbon atoms and wherein the combination of the substituents of R_1 and R_2 is the same as the combination of the substituents of R_3 and R_4; n is an integer from 1 to 2 and X is a number from 0 to 1.

3,981,861

ANTIBIOTIC AMINOGLYCOSIDES, PROCESSES OF PREPARATION AND PHARMACEUTICAL COMPOSITIONS

Jean Bernard Chazan, Paris; Daniel Coussediere, Villejuif, and Jean-Claude Gasc, Bondy, all of France, assignors to Roussel-UCLAF, Paris, France

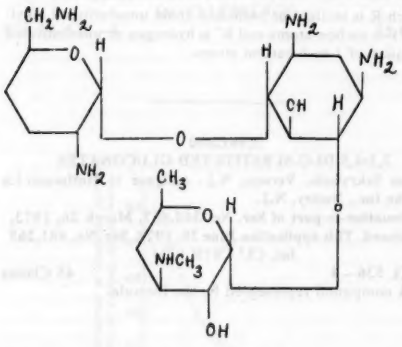
Filed Mar. 7, 1975, Ser. No. 556,405

Claims priority, application France, Mar. 12, 1975, 75.08314

Int. Cl.² C07H *15/22*

U.S. Cl. 536—17 **5 Claims**

1. The 4-0-(2′,6′-diamino 2′,3′,4′,6′-tetradesoxy α,D-erythrohexopyrannosyl) 6-0-(3′′-methylamino 3′′,4′′,6′′-tridesoxy α,D-xylohexopyrannosyl) 2-desoxystreptamine of the formula:



I

and its pharmaceutically acceptable salts.

3,981,862

PREPARATION OF C22-ALKYL DERIVATIVE OF DIGOXIN

Wolfgang Voigtlander, Viernheim; Fritz Kaiser, Lampertheim; Wolfgang Schaumann, Heidelberg, and Kurt Stach, Mannheim-Waldhof, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

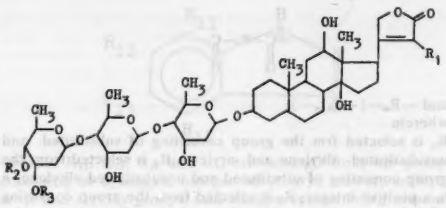
Filed Mar. 14, 1975, Ser. No. 558,381

Claims priority, application Germany, Apr. 13, 1974, 2418127; July 12, 1974, 2433563; Dec. 4, 1974, 2457219

Int. Cl.² C07J *19/00*

U.S. Cl. 536—7 **11 Claims**

1. A process for the preparation of a C22-alkyl-derivative of digoxin of the formula

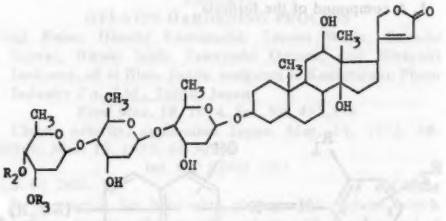


in which

R_1 is alkyl containing up to 4 carbon atoms,

R_2 and R_3 are selected from the group consisting of hydrogen, lower alkanoyl, benzyl, carbobenzoxy, trimethylsilyl, tetrahydropyranyl and phosphonic acid or together are alkylidene,

comprising reacting a compound of the formula



with an alkyl iodide of the formula R_1I in the presence of a strongly polar aprotic solvent and an alkali metal hydride.

3,981,863

CYANOCOBALAMIN DERIVATIVES

Gordon Dean Niswender, and James M. Hudson, both of Fort Collins, Colo., assignors to Micromedic Diagonistics, Inc., Horsham, Pa.

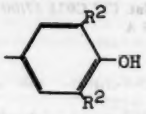
Filed Feb. 25, 1975, Ser. No. 552,919

Int. Cl.² C07H *23/00*

U.S. Cl. 536—25 **7 Claims**

1. A vitamin B_{12} derivative in which a hydroxyphenyl group is covalently bonded through one of the $-CH_2CH_2CONH_2$ or $-CH_2CONH_2$ groups initially present in one of the pyrrole

nuclei of the vitamin B_{12} molecule, the hydroxyphenyl group being of the formula



wherein R^2 is H or iodine, at least one of R^2 being ^{125}I or ^{131}I.

3,981,864

1,3-BENZODIOXOL DERIVATIVES

Satoru Tanaka, Higashikurume, and Hideaki Watanabe, Ushiku, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

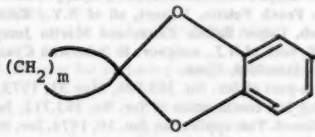
Filed Sept. 5, 1974, Ser. No. 503,515

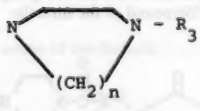
Claims priority, application Japan, Sept. 8, 1973, 48-100761; Sept. 8, 1973, 48-100762

Int. Cl.² C07D *405/02*, *267/08*

U.S. Cl. 260—239 BC 2 Claims

1. A member of the group consisting of a compound of the formula





wherein *m* is an integer of 4 or 5, R_3 is methyl, phenyl, halogen substituted phenyl or benzhydryl, and *n* is an integer of 2 or 3 and a pharmalogically acceptable salt thereof.

3,981,865

BIS-TYPE PENICILLINS AND PROCESS FOR PRODUCING THE SAME

Isamu Saikawa; Shuntaro Takano; Okuta Takashima, all of Toyama; Kaishu Momonoi, Shinminato; Seietsu Kuroda, Toyama; Miwako Komatsu, Fuchu; Takashi Yasuda, Kosugi; Kyoko Kasuya, Takaoka, and Yutaka Kodama, Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

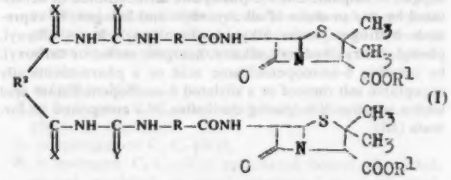
Filed June 11, 1975, Ser. No. 586,015

Claims priority, application Japan, June 27, 1974, 49-72798; Aug. 15, 1974, 49-92755; Sept. 3, 1974, 49-100565; May 26, 1975, 50-62761

Int. Cl.² C07D *499/66*, *499/68*, *499/70*

U.S. Cl. 260—239.1 14 Claims

1. A compound represented by the general formula (I),



(I)

wherein R is the radical derived from a conventional penicillin acylamido group represented by the formula

in which R^4 represents a substituted or unsubstituted alkyl, cycloalkyl, cycloalkenyl, cycloalkadienyl, aryl, aralkyl, aryloxy, alkylthioalkyl, or a heterocyclic group; and R^5 represents a hydrogen atom; R^4 and R^5 together with the common carbon atom may form a cycloalkyl, cycloalkenyl or cycloalkadienyl ring; R^1 represents a hydrogen atom, a conventional penicillin blocking group or a conventional penicillin saltforming cation R^3 represents a substituted or unsubstituted alkylene, alkenylene, cycloalkylene, arylene, alkylenediaryl group; X and Y are individually an oxygen atom or a sulfur atom.

3,981,866

PENICILLIN MONOESTERS, THEIR PRODUCTION AND INTERMEDIATES THEREOF

John Peter Clayton, and Harry Ferres, both of Horsham, England, assignors to Beecham Group Limited, Great Britain

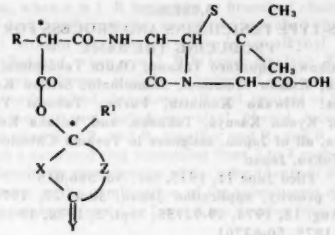
Filed Sept. 21, 1973, Ser. No. 399,326

Claims priority, application United Kingdom, Sept. 8, 1972, 41756/72

Int. Cl.² C07D *499/12*, *499/72*

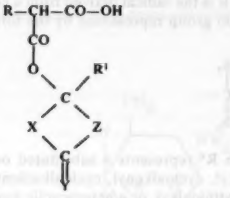
U.S. Cl. 260—239.1 11 Claims

1. A process for the preparation of a compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

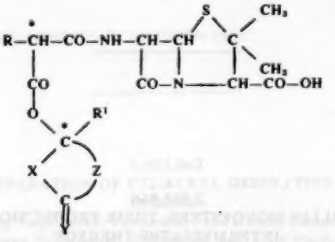
wherein R is lower alkyl, cycloalkyl of 3–6 carbon atoms, phenyl or 2- or 3-thienyl, tetrahydropyranyl or thiacyclohexanyl; X and Y are the same or different and each represents oxygen or sulphur; Z is 1,2-phenylene unsubstituted or substituted by one or more of alkoxy, nitro and halogen; R^1 represents hydrogen, lower alkyl, lower alkenyl, lower alkynyl, phenyl, benzyl, hydroxy, alkoxy, halogen, amino or carboxyl, by reacting 6-aminopenicillanic acid or a pharmaceutically acceptable salt thereof or a silylated 6-aminopenicillanic acid with a reactive N-acylating derivative of a compound of formula (III):



(III)

wherein R, R^1, X, Y and Z have the same meaning as in formula (I), and when a silylated 6-aminopenicillanic acid is employed, thereafter removing the silyl groups from the resultant compound by hydrolysis or alcoholysis.

4. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

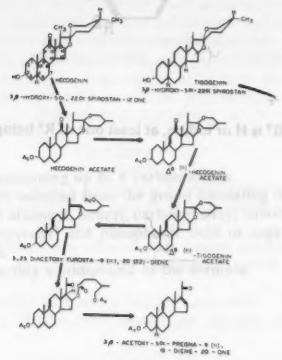
wherein R is lower alkyl, cycloalkyl of 3–6 carbon atoms, phenyl, or 2- or 3-thienyl, tetrahydropyranyl or thiacyclohexanyl; X and Y are the same or different and each represents oxygen or sulphur; Z is 1,2-phenylene unsubstituted or substituted by one or more of alkoxy, nitro and halogen; R^1 represents hydrogen, lower alkyl, lower alkenyl, lower alkynyl, phenyl, benzyl, hydroxy, alkoxy, halogen, amino or carboxyl.

3,981,867

PROCESS FOR OBTAINING SAPOGENIN PARTICULARLY HECOGENIN FROM PLANT MATERIAL SUCH AS AGAVE SISALANA LEAVES

Max G. Beauvoir, P.O. Box 2187, Port-au-Prince, Haiti

Filed Mar. 17, 1975, Ser. No. 559,012
Int. Cl.² C07J *17/00*
U.S. Cl. 260—239.55 A **14 Claims**



1. A process for obtaining steroid content from saponin-containing juices of certain plant material, which process comprises:

acidifying said juices to a pH of from 0.4 to 1.5 with an acid selected from the group consisting of sulfuric, hydrochloric and phosphoric acids;

subjecting said acidified juices to acid hydrolysis by heating them to a predetermined temperature under a pressure of from 40 to 125 p.s.i.g. for a fixed period of time to produce a hydrolyzate containing crude hecogenin; and

separating said crude hecogenin from said hydrolyzate.

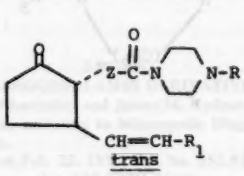
3,981,868

DERIVATIVES OF 9-OXO-13-TRANS-PROSTENOIC ACID AMIDES

Karel Francis Bernady; Middleton Brawner Floyd, Jr., both of Suffern; John Frank Poletto, Nanuet, all of N.Y.; Robert Eugene Schaub, Upper Saddle River, and Martin Joseph Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 365,806, May 31, 1973, abandoned, which is a continuation of Ser. No. 162,712, July 14, 1971, abandoned. This application Jan. 10, 1974, Ser. No. 432,264
Int. Cl.² C07D *103/737*
U.S. Cl. 260—240 J **29 Claims**

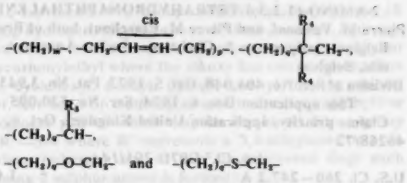
1. A compound selected from the group consisting of an optically active compound of the formula:



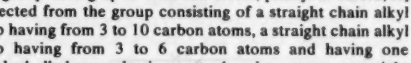
trans

and a racemic mixture of that formula and the mirror image thereof wherein R is selected from the group consisting of methyl and phenyl; Z is a divalent radical selected from the

group consisting of those of the formulae:



wherein *m* is an integer from 1 to 8, inclusive, *p* is an integer from 2 to 4, inclusive, *q* is an integer from 3 to 6, inclusive, R_4 is an alkyl group having up to 3 carbon atoms, and R_5 is an alkyl group having up to 4 carbon atoms, phenyl or fluoro; R_1 is selected from the group consisting of a straight chain alkyl group having from 3 to 10 carbon atoms, a straight chain alkyl group having from 3 to 6 carbon atoms and having one branched alkyl group having up to 4 carbon atoms, a straight chain alkenyl group having from 3 to 6 carbon atoms, a straight chain ω-haloalkyl group having from 3 to 6 carbon atoms, a straight chain ω-phenylalkyl group having from 1 to 4 carbon atoms in the chain, a straight chain ω-(cycloalkyl)alkyl group having from 1 to 4 carbon atoms in the chain and from 5 to 7 carbon atoms in cycloalkyl, and moieties of the formulae:



wherein *p* and R_4 are as hereinabove defined; and the pharmaceutically acceptable anionic salts thereof.

3,981,869

PROCESS FOR THE PREPARATION OF HETEROCYCLIC COMPOUNDS

Peter Ziemek, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

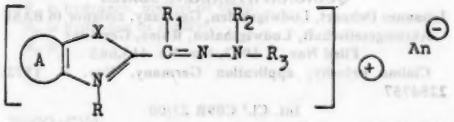
Filed Aug. 5, 1974, Ser. No. 494,911

Claims priority, application Germany, Aug. 10, 1973, 2340571

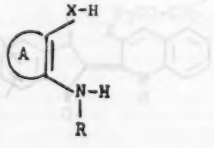
Int. Cl.² C09B *23/04*

U.S. Cl. 260—240 G **6 Claims**

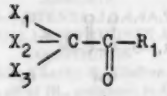
1. Process for preparing compounds of the formula



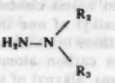
by condensing an amine of the formula



with a carbonyl compound of the formula



in the presence of a hydrazine of the formula



wherein

A is a benzene; naphthalene; pyridine; pyrimidine; or a pyrazine ring; or a benzene or naphthalene ring which is substituted with halogen, C_1-C_4-alkyl, cyclohexyl, phenyl, C_1-C_4-alkoxy, nitro, cyano, amino, C_1-C_4-alkyl-carbonylamino, C_1-C_4-alkyl-sulphonylamino, C_1-C_4-alkyl-sulphonyl, phenylsulphonyl, tolyl-sulphonyl, benzylsulphonyl, hydroxyl, carboxyl, carboalkoxy with 1 to 4 C atoms in the alkoxy group, carbonamide or sulphonamide;

X is O, S or N-R_4;

R_4 is hydrogen, C_1-C_4-alkyl; cyclohexyl; benzyl; phenethyl; phenyl or naphthyl;

R_1 is hydrogen or C_1-C_4-alkyl;

R_2 is hydrogen, C_1-C_4-alkyl; cyclohexyl; benzyl; phenethyl; phenyl; naphthyl; or pheyl substituted by C_1-C_4-alkyl, C_1-C_4-alkoxy, nitro, halogen, C_1-C_4-dialkylamino, or benzyl;

R_3 is hydrogen, C_1-C_4-alkyl; cyclohexyl; benzyl; phenethyl; phenyl; naphthyl; phenyl substituted by C_1-C_4-alkyl, C_1-C_4-alkoxy, nitro, halogen, C_1-C_4-dialkylamino, or benzyl; benzthiazolyl-2; benzoxazolyl-2; benzimidazolyl-2; oxazolyl-2; triazolyl-2; thiazolyl-2; thiophenyl-2; purine-2; pyridine-2; pyrimidine-2; cinnolinyl-3; quinoxazinyl-2; or quinazolinyl-2; or

R_2 and R_3 conjointly with the N atom form an indoline; carbazole or tetrahydroquinoline radical or one of the foregoing radicals substituted by C_1-C_4-alkyl, C_1-C_4-alkoxy or halogen;

R is hydrogen, C_1-C_4-alkyl; allyl; cyclohexyl; benzyl; phenethyl; phenyl or naphthyl;

An ⁻ is an anion;

X_1 is hydroxyl, methoxy, ethoxy or halogen; and

X_2 and X_3 are halogen or conjointly are oxygen.

3,981,870

PLANT GROWTH REGULANT CARBAMOYLPHOSPHONATES

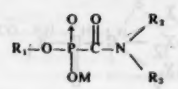
William P. Langsdorf, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 478,968, June 13, 1974, which is a division of Ser. No. 283,769, Aug. 25, 1972, Pat. No. 3,846,512, which is a continuation-in-part of Ser. No. 85,221, Oct. 29, 1970, Pat. No. 3,819,353, which is a continuation-in-part of Ser. No. 803,962, March 3, 1969, abandoned, which is a continuation-in-part of Ser. No. 731,732, May 24, 1968, Pat. No. 3,627,507. This application Feb. 28, 1975, Ser. No. 554,227

Int. Cl.² C07F *9/65*

U.S. Cl. 260—242 **4 Claims**

1. A compound of the formula:

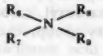


wherein:

R_1 is alkyl of one through six carbon atoms, chloroalkyl of one through six carbon atoms containing up to three chlorine atoms, bromoalkyl of one through six carbon atoms containing up to three bromine atoms, alkoxy alkyl of three through seven carbon atoms, alkenyl of two through six carbon atoms, alkynyl of three through four carbon atoms, phenyl or benzyl;

R_2 and R_3 are taken together to form a ring of the configuration $-(CH_2)_2-O-(CH_2)_2-$;

M is selected from the group consisting of ammonium, hydrogen, sodium, lithium, potassium, calcium, magnesium, zinc, manganese barium or



where R_6, R_7 and R_8 can be the same or different and each can be hydrogen, alkyl of one through four carbon atoms, or hydroxy alkyl of two through four carbon atoms; and R_9 is hydrogen, alkyl of one through twelve carbon atoms, allyl, benzyl, amino, methylamino, or dimethylamino; R_6 and R_7 can be taken together to form a ring that is $-(CH_2)_2-O-(CH_2)_2-$ or $-(CH_2)_n-$ where n is 2–6 and R_8 and R_9 are H.

3,981,871

2-(5,6-DIHYDRO-4H-1,3-THIAZIN-2-YL)-2-NITROETHENAMINE INSECT CONTROL AGENTS

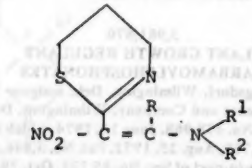
James E. Powell, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed June 27, 1975, Ser. No. 590,990

Int. Cl.² C07D 279/06

U.S. Cl. 260—243 R 2 Claims

1. A compound of the formula:



wherein R is hydrogen, straight-chain or branched-chain alkyl of from one to six carbon atoms, phenyl or phenyl substituted by one or more of halogen, nitro, cyano, straight-chain or branched chain alkyl or alkoxy of from one to four carbon atoms, or phenoxy, and R^1 and R^2 each is straight-chain or branched-chain alkyl of from one to ten carbon atoms, or phenyl, optionally substituted as described for R, above.

3,981,872

DERIVATIVES OF 2-AMINO-(1,2,3,4-TETRAHYDRONAPHTHALENE)

Pierre M. Vanhoof, and Pierre M. Clarebout, both of Brussels, Belgium, assignors to A. Christiaens Societe Anonyme, Brussels, Belgium

Division of Ser. No. 404,048, Oct. 5, 1973, Pat. No. 3,943,172.

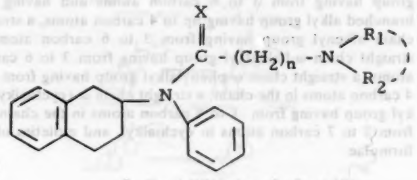
This application Dec. 6, 1974, Ser. No. 530,095

Claims priority, application United Kingdom, Oct. 6, 1972, 46268/72

Int. Cl.² C07D 295/14

U.S. Cl. 260—247.2 A 1 Claim

1. A derivative of 2-amino(1,2,3,4-tetrahydronaphthalene) of the formula:



(I)

in which $n = 1$ or 2, X represents two hydrogen atoms or one oxygen atom, R_1 and R_2 form together with the attached nitrogen atom a morpholino, piperidino, pyrrolidino or piperazino ring, with the proviso that R_1 may also represent hydrogen, and R_3 represents hydrogen or a lower alkoxy group, as well as the pharmaceutically acceptable acid addition salts of said compounds of formula (I).

3,981,873

SULFUR CONTAINING DYES OF THE QUINONAPHTHALONE SERIES

Johannes Dehnert, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Rhine, Germany

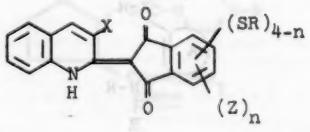
Filed Nov. 7, 1973, Ser. No. 413,663

Claims priority, application Germany, Nov. 9, 1972, 2254757

Int. Cl.² C09B 25/00

U.S. Cl. 260—289 H 6 Claims

1. A dye having the formula:



in which

X is hydrogen or hydroxy

Z is chlorine or bromine and
n is zero, 1, 2 or 3 and
$(SR)_{4-n}$ represents 4—*n* groups which may be separate (R denoting hydrogen, alkyl of one to 12 carbon atoms, hydroxyalkyl of two or three carbon atoms, alkoxycarbonyl-methyl or alkoxycarbonylethyl where the alkoxy has one to four carbon atoms, cyclohexyl, benzyl, phenyl, phenyl bearing chloro, methyl, tert-butyl or methoxy as substituents or naphthyl) or any adjacent pair of which may be combined into a group —S—R′—S— where R′ represents a 3,4-toluylene- or a dimethylene (whereby one or two six-membered rings each containing 2 sulphur atoms is formed).

3,981,874

N-[(METHOXYMETHYL-FURYL)-METHYL]-MORPHINANS OR -6,7-BENZOMORPHANS AND SALTS THEREOF

Herbert Merz; Adolf Langbein, both of Ingelheim am Rhein; Gerhard Walther, and Klaus Stockhaus, both of Bingen (Rhine), all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

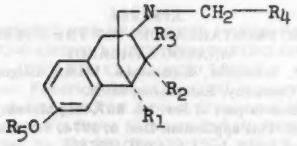
Filed Oct. 15, 1974, Ser. No. 514,474

Claims priority, application Germany, Oct. 27, 1973, 2354002

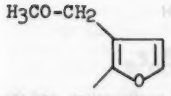
Int. Cl.² C07D *221/26*

U.S. Cl. 260—293.54 **6 Claims**

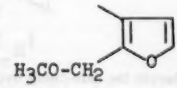
1. A compound of the formula



wherein
R_1 is methyl, ethyl or propyl,
R_2 is hydrogen, methyl or ethyl,
R_3 is hydrogen or methyl,
R_4 is



or



, and

R_5 is hydrogen, methyl or acetyl, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,981,875

2-SUBSTITUTED-9-PHENYL-2,3,4,4A,9,9A-HEXAHYDRO-1H-INDENO[2,1-C]PYRIDINES AND RELATED COMPOUNDS

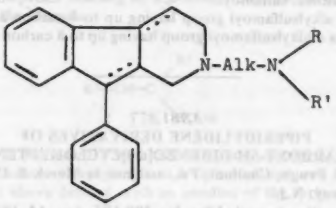
John W. Cusic, Skokie; Charles R. Ellefson, Chicago, and Chi Min Woo, Skokie, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed June 16, 1975, Ser. No. 587,405

Int. Cl.² C07D *401/06, 221/16*

U.S. Cl. 260—293.54 **15 Claims**

1. A compound of the formula



(I)

wherein Alk is alkylene of 2 to 6 carbon atoms separating the nitrogen atoms attached thereto by at least 2 carbon atoms; NRR′ is selected from the group consisting of di(lower alkyl-)amino, pyrrolidino, piperidino, and hexamethyleneimino; and the dotted lines indicate the optional presence of a set of double bonds.

3,981,876

1-ALKYL-4-(10[1-PIPERIDYL]-5H-DIBENZO-[A,D]CYCLOHEPTEN-5-YLIDENE)PIPERIDINE COMPOUNDS

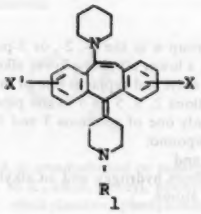
John D. Prugh, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 9,049, Feb. 5, 1970, abandoned. This application Aug. 14, 1972, Ser. No. 280,697

Int. Cl.² C07D *211/28*

U.S. Cl. 260—293.62 **2 Claims**

1. A compound of the formula



wherein
R_1 is lower alkyl;
X and X′ are similar or dissimilar and are selected from hydrogen,
an alkyl group having up to 6 carbon atoms,
a perfluoroalkyl group having up to 4 carbon atoms,
phenyl amino,
an alkylamino group having up to 4 carbon atoms, a dialkylamino group having up to 8 carbon atoms,
an alkylsulfonylamino group having up to 4 carbon atoms, halogen (fluorine, chlorine, bromine or iodine),
hydroxyl,
an alkoxy group having up to 4 carbon atoms,

a perfluoroalkoxyl group having up to 4 carbon atoms,
cyano,
carboxy,
carbamoyl,
an alkylcarbamoyl group having up to 5 carbon atoms,
a dialkylcarbamoyl group having up to 9 carbon atoms,
a carbalkoxy group having up to 6 carbon atoms,
an alkylmercapto group having up to 4 carbon atoms,
a perfluoroalkylmercapto group having up to 4 carbon atoms,
an alkylsulfonyl group having up to 4 carbon atoms,
a perfluoroalkylsulfonyl group having up to 4 carbon atoms, sulfamoyl,
an alkylsulfamoyl group having up to 4 carbon atoms,
or a dialkylsulfamoyl group having up to 8 carbon atoms.

3,981,877
PIPERIDYLIDENE DERIVATIVES OF CARBOXY-5H-DIBENZO[a,d]CYCLOHEPTENE

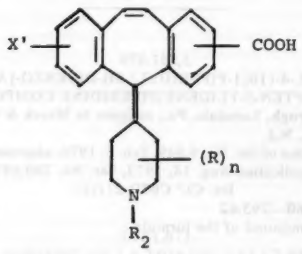
John D. Prugh, Chalfont, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 280,685, Aug. 14, 1972, Pat. No. 3,960,872, which is a continuation of Ser. No. 9,049, Feb. 5, 1970, abandoned, which is a continuation-in-part of Ser. No. 4,123, Jan. 19, 1970, abandoned. This application June 5, 1974, Ser. No. 476,631

Int. Cl.² C07D *211/78*

U.S. Cl. 260—293.62 **2 Claims**

1. A 5H-dibenzo[a,d]cycloheptene compound of the formula



wherein
the carboxyl group is in the 1-, 2-, or 3-position;
R_2 is hydrogen, a lower alkyl or a lower alkenyl substituent;
R is methyl or ethyl and replaces one or more of the hydrogens in positions 2, 3, 5 or 6 of the piperidine ring, provided that only one of positions 3 and 5 is substituted in any one compound;
n is 0, 1 or 2; and
X' is selected from hydrogen and an alkyl group having up to 6 carbon atoms.

3,981,878
4-PHENYLMERCAPTOPIPERIDINE NITRILES

Adrian Charles Ward Curran, Reading, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

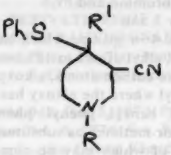
Continuation-in-part of Ser. No. 299,995, Oct. 24, 1972, Pat. No. 3,845,064. This application May 10, 1974, Ser. No. 468,726

Claims priority, application United Kingdom, Oct. 29, 1971, 50431/71

Int. Cl.² C07D *211/60*

U.S. Cl. 260—293.73 **2 Claims**

1. A compound of the formula



wherein R is loweralkyl or phenylloweralkyl, R^1 is hydrogen or loweralkyl and Ph is phenyl, or a pharmaceutically acceptable acid addition salt thereof.

3,981,879
PREPARATION OF CYANOPYRIDINES

Glenn R. Elion, Avenel, and Arthur E. Klink, Lebanon, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 18, 1975, Ser. No. 633,057

Int. Cl.² C07D *213/57*

U.S. Cl. 260—294.9 **5 Claims**

1. A process for the production of cyanopyridines from alkyl pyridines wherein the alkyl group contains 1 to 2 carbon atoms which comprises passing as a reactant stream a gaseous mixture comprising:
1. an alkyl substituted pyridine;
2. ammonia;
3. steam; and
4. oxygen

wherein the mole ratios of said reactants are:
ammonia:alkyl pyridine, 1:1 to 10:1;
steam:alkyl pyridine, 0.01:1 to 10:1;
oxygen:alkyl pyridine, 2:1 to 50:1
the improvement being passing said reactant stream over a fixed bed ammoxidation catalyst at a temperature of about 280°C. to 400°C. and wherein said catalyst consists essentially of $(V_2O_5+MoO_3+P_2O_5+SnO_2)$/pumice in a molar ratio of 2.5:1.0:0.015:3.5 wherein the weight % loading of the catalyst on the pumice support is in the range from about 5 to 50%.

3,981,880
RACEMIC PROSTAGLANDINS OF THE 2-SERIES AND ANALOGS THEREOF

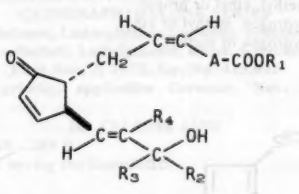
William P. Schneider, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 807,405, March 14, 1968, abandoned. This application Dec. 6, 1974, Ser. No. 530,439

Int. Cl.² C07C *177/00*

U.S. Cl. 260—468 D **12 Claims**

1. A racemic compound of the combination of the formula:



wherein the side-chain hydroxy is in S configuration, and the mirror image of that formula; wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one to 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R_2 is $-(CH_2)_a-CH_3$ wherein *a* is 2, 3, 4, 5, or 6, or $-(CH_2)_d-X$ wherein d is zero, one, 2, 3, or 4 and X is isobutyl, tert-butyl, 3,3-difluorobutyl, 4,4-difluorobutyl, or 4,4,4-trifluorobutyl; wherein R_3 and R_4 are hydrogen or alkyl of one to 4 carbon

atoms, inclusive; wherein A is trimethylene or $-CH_2-Z-$ wherein Z is ethylene substituted with one or 2 fluoro, methyl, or ethyl; and pharmacologically acceptable salts thereof when R_1 is hydrogen.

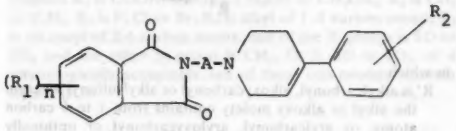
3,981,881

2-[(4-PHENYL-TETRAHYDROPYRIDINYL)ALKYL]-1H-ISOINDOLE-1,3(2H)-DIONES

Peter C. Wade, Pennington, N.J., and B. Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 14, 1975, Ser. No. 604,748
Int. Cl.² C07D *211/70*
U.S. Cl. 260—295 M 10 Claims

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein A is an alkylene group having 1 to 8 carbon atoms; R_1 is hydrogen, halogen, alkyl, alkoxy, alkylthio, nitro, amino or cyano; R_2 is hydrogen, halogen, alkyl, alkoxy, trifluoromethyl, nitro, amino or cyano; and n is 1 or 2, with the proviso that when n is 2, R_1 is alkyl, alkoxy, or halogen; wherein alkyl, alkoxy, and alkylthio are groups having 1 to 4 carbon atoms.

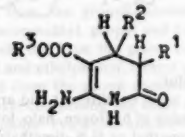
3,981,882

PROCESS FOR PREPARING 4-ARYL OF HETERO-6-AMINO-3,4-DIHYDROPYRID-2-ONE-3,5-DICARBOXYLIC ACID ESTER

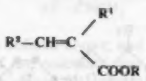
Horst Meyer; Friedrich Bossert, both of Wuppertal; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 531,999, Dec. 12, 1974, which is a division of Ser. No. 390,193, Aug. 21, 1973, Pat. No. 3,925,395. This application July 16, 1975, Ser. No. 596,507
Claims priority, application Germany, Aug. 31, 1972, 2242787
Int. Cl.² C07D *213/55*
U.S. Cl. 260—295.5 R 6 Claims

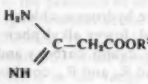
1. A process for the production of a compound of the formula:



wherein R^1 is hydrogen or straight or branched chain lower alkyl; R^2 is lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl of 3 to 7 carbon atoms, cycloalkenyl of 3 to 7 carbon atoms, aryl unsubstituted or substituted by 1 to 3 of the same or different substituents selected from the group consisting of lower alkyl, lower alkoxy, halogen, nitro, cyano, trifluoromethyl, carb. lower alkoxy and SO_n-lower alkyl wherein n is 0, 1 or 2, or R^2 is naphthyl, quinolyl, isoquinolyl, pyridyl, pyrimidyl, thenyl, suryl or pyrryl unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of lower alkyl, lower alkoxy and halogen; and R^3 is straight or branched chain lower alkyl, straight or branched chain lower alkenyl, straight or branched chain lower alkynyl, or straight or branched chain lower alkyl, straight or branched chain lower alkenyl or straight or branched chain lower alkynyl interrupted by 1 or 2 oxygen atoms;
which comprises reacting an α,β-unsaturated carboxylic acid ester of the formula



wherein R is alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms or alkynyl of 2 to 6 carbon atoms; and R^1 and R^2 are as above defined, with an amidine of the formula:



wherein R^3 is as above defined, and recovering the compound produced.

3,981,883

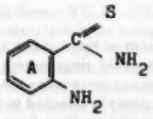
MANUFACTURE OF 3-AMINO-2,1-BENZISOTHIAZOLES

Rolf Niess, Schifferstadt, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 6, 1975, Ser. No. 556,155
Claims priority, application Germany, Mar. 18, 1974, 2412975
Int. Cl.² C07D *277/60*
U.S. Cl. 260—304 A 10 Claims

1. In a process for the manufacture of 3-amino-2,1-benzisothiazoles of the formula

wherein the ring A is unsubstituted or substituted by chloro, bromo, nitro, C_1- to C_4-alkyl, benzyl, phenyl, amino, C_1- to C_4-alkylamino or -dialkylamino, phenylamino, acetyl, benzoyl, hydroxy, methoxy, ethoxy, phenoxy, sulfamoyl, C_1- to C_4-mono- or di-alkyl-substituted sulfamoyl, phenylsulfamoyl, methylsulfonyl, ethylsulfonyl or phenylsulfonyl, by oxidative ring closure of a thioamide of the formula



the improvement which comprises effecting the ring closure in about 85 to 110% sulfuric acid at temperatures of about 10° to 160°C.

3,981,884

MULTICHROMOPHORIC BENZOTRIAZOLE ULTRAVIOLET STABILIZERS

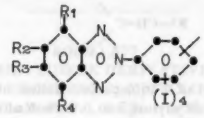
Richard H. S. Wang, and Joseph S. Zannucci, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,333
Int. Cl.² C07D 249/20
U.S. Cl. 260—308 B 34 Claims

1. A composition of matter comprising multichromophoric compounds having the formula:

A—B—C

wherein A is a group having the structure



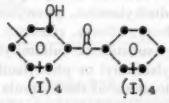
wherein

R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo, lower alkyl, cycloalkyl, phenyl, lower alkyl phenyl, phenyl-substituted-phenyl, alkoxy, cyano, carboxy and the substituents R_1 R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the heterocyclic ring and the carbon atom attached to the B group connecting the heterocyclic aromatic A group with the aromatic C group, wherein B is a linking group connecting A and C and is alkylene, phenylene, carbonyloxy, oxycarbonylalkyleneoxy, oxycarbonyl, alkyleneoxycarbonyloxy, oxyalkylenecarbonyloxy, oxycarbonyloxy, alkyleneoxy, oxyalkylene, alkyleneoxyalkyleneoxy, oxyalkylenephenylenealkyleneoxy, sulfinyldioxy, oxy(alkoxy)phosphinooxy, N-alkylamino carbonyl, N-phenylaminocarbonyl, N-alkylaminocarbonylalkyleneoxy, N-phenylaminocarbonylalkyleneoxy, N-alkylaminocarbonylamino, N,N-dialkylaminocarbonyl, N-phenylaminocarbonyl, N-alkylaminocarbonyl, N,N-diphenylaminocarbonyl, N-alkylamino, N-phenylamino, N-alkylaminoalkyleneoxy, N-phenylaminoalkyleneoxy, oxyalkyleneoxy, oxyphenyleneoxy, alkyleneaminoalkylene, phenyleneaminophenylene, phenyleneaminoalkylene and alkyleneaminophenylene; and

wherein

C is a hydroxybenzophenone group having the formula



wherein

I is the same substituent as listed above and is present in all positions of the benzoid rings except the carbon atom attached to the B group connecting the A and C moieties, said B connecting group is attached to the benzoid ring in the ortho, meta or para position from the keto group of the benzophenone, and said I substituents can all be one of the substituents listed above or different listed substituents.

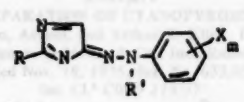
3,981,885

2-ALKYL-PHENYLHYDRAZONOMIDAZOLENINES

Karl Heinz Buchel, Wuppertal-Elberfeld; Paul-Ernst Frohberger; Hans Scheinpflug, both of Leverkusen, and Edgar Enders, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 261,828, June 12, 1972, Pat. No. 3,925,551. This application July 24, 1975, Ser. No. 598,604
Claims priority, application Germany, June 15, 1971, 2129524
Int. Cl.² C07D 233/88
U.S. Cl. 260—309 3 Claims

1. A 2-substituted phenylhydrazonoimidazolenine of the formula



in which

R′ is alkylcarbonyl, alkoxycarbonyl or alkylsulfonyl wherein the alkyl or alkoxy moiety contains from 1 to 6 carbon atoms; or arylcarbonyl, aryloxycarbonyl or optionally chlorine substituted arylsulfonyl wherein the aryl moiety contains 6 to 10 carbon atoms,

X is halogen, nitro, or alkyl, haloalkyl, alkoxy, alkythio, alkylamino or dialkylamino wherein the alkyl or alkoxy moiety contains up to 6 carbon atoms, and

a. R is alkyl of up to 16 carbon atoms, and *m* is 1 to 4, or

b. R is alkyl of 2 to 16 carbon atoms, and *m* is 0 to 4.

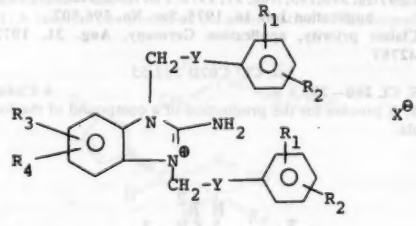
3,981,886

AMINO-BENZIMIDAZOLE DERIVATIVES

Harry L. Yale, New Brunswick, and James A. Bristol, Boonton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 20, 1975, Ser. No. 542,158
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² C07D 235/30
U.S. Cl. 260—309.2 12 Claims

1. A compound of the structure



wherein

Y is oxygen or sulfur;

R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, halo, lower alkyl, lower alkoxy, trifluoromethyl or N,N-dimethylsulfonamido;

R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halo, phenyl, naphthyl, phenyl lower alkyl, naphthyl lower alkyl, or phenyl or naphthyl substituted with an R_1 or R_2 group; and

X is selected from the group consisting of Cl, Br or I.

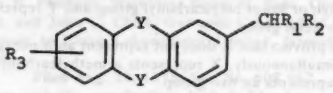
3,981,887

SULFOXIDES AND SULFONES

Joachim Gante; Hans-Adolf Kurmeier; Werner Mehrhof, and Albrecht Wild, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed July 31, 1974, Ser. No. 493,459
Claims priority, application Germany, Aug. 4, 1973, 2339617
Int. Cl.² C07D 335/12, 339/08, 327/08
U.S. Cl. 260—327 P 9 Claims

1. A compound of the formula



wherein R_1 is COOH, $COOR_4$, CH_2OH or CH_2OR_5; R_2 is CH_3 or C_2H_5; R_3 is F, Cl or Br; R_4 is alkyl of 1–8 carbon atoms; R_5 is alkanoyl of 2-4 carbon atoms; one of the Y groups is SO or SO_2 and the other Y group is CH_2, O, S, SO or SO_2; or a physiologically acceptable salt of those compounds wherein R_1 is COOH.

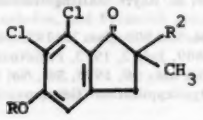
3,981,888

PROCESS FOR PREPARING (1-OXO-2-PHENYL, HALOPHENYL OR THIENYL-2-METHYL-6,7-DICHLORO-5-INDANYLOXY)ACETIC ACID

Warren K. Russ, Jr., Piscataway; George G. Hazen, and Earl M. Chamberlin, both of Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

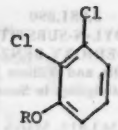
Filed July 30, 1974, Ser. No. 492,652
The portion of the term of this patent subsequent to Apr. 13, 1993, has been disclaimed.
Int. Cl.² C07D 333/24
U.S. Cl. 260—332.2 A 5 Claims

1. The process for preparing a compound of the formula:

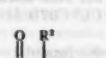


wherein R^2 is phenyl, halophenyl or thienyl, R is CH_2COOH, R^1 or CH_2COOR^1, and wherein R^1 is lower alkyl or halo lower alkyl selected from the group consisting of methyl, ethyl, isopropyl, trifluoromethyl, propyl and butyl; phenyl or substituted phenyl selected from the group consisting of nitrophenyl, tolyl, xylyl and ethylphenyl; benzyl or nuclear substituted benzyl selected from the group consisting of p-chlorobenzyl and p-nitrobenzyl comprising the steps of:

a. reacting under Friedel-Crafts conditions wherein said conditions comprise the use of a Lewis acid catalyst selected from the group consisting of aluminum trichloride, $SnCl_4$, $AlBr_3$ and BF_3; and the use of an organic solvent which does not react with the reactants; and wherein said reaction is carried out at a temperature from about 0°C. to about 50°C; an ether derivative of 2,3-dichlorophenol of the formula:



wherein R is as defined above and a 2-substituted propriony halide of the formula:



wherein R^2 is as defined above; and X is halo; wherein the molar ratio of the reactants may range from about 2:1 respectively to about 1:4 respectively; and wherein the amount of catalyst ranges from about 25 to about 200 mole % based on the ether derivative of 2,3-dichlorophenol; and

b. reacting the resulting propiophenone of Step a.) with formaldehyde in the presence of an acid selected from the group consisting of trifluoroacetic acid, methanesulfonic acid, borontrifluoride, H_2SO_4, HF and phosphoric acid; wherein the molar ratio of the propiophenone of Step a.) to formaldehyde, is in the range of from about 1:1 to about 1:10; wherein the molar ratio of the acid relative to the propiophenone ranges from about 0.05 to about 0.99; and wherein the reaction is carried out at a temperature in the range of from about 25°C to about 150°C.

3,981,889

METHOD OF MANUFACTURING CIS,CIS-2,4,6-TRIISOPROPYL-1,3,5-TRIOXANE

Masao Fujita, Amagasaki; Takuya Akiyama, Nagaokakyo; Yoshito Saeki, Sulta, and Yasuhiko Ueno, Kawanishi, all of Japan, assignors to Ogawa & Co., Ltd., Japan

Filed Apr. 22, 1974, Ser. No. 463,175
Claims priority, application Japan, June 4, 1973, 48-64116; June 4, 1973, 48-64117; Nov. 6, 1973, 48-126043
Int. Cl.² C07D 323/04
U.S. Cl. 260—340 2 Claims

1. A method for producing cis,cis-2, 4, 6-triisopropyl-1, 3, 5-trioxane by cyclic trimerization of isobutylaldehyde, which comprises adding dropwise under stirring isobutylaldehyde to a 52 to 60 weight % solution of sulfuric acid, and stirring the resultant mixture after the addition is completed, the reaction temperature being from −5°C to 10°C and the mole ratio of sulfuric acid to isobutylaldehyde being from 0.1:1 to 10:1.

2. A method for producing cis,cis-2, 4, 6-triisopropyl-1, 3, 5-trioxane by cyclic trimerization of isobutylaldehyde, which comprises adding dropwise under stirring isobutylaldehyde to a 75 to 85 weight % solution of phosphoric acid, and stirring the resultant mixture after the addition is completed, the reaction temperature being from −5°C to 10°C and the mole ratio of phosphoric acid to isobutylaldehyde being from 0.1:1 to 10:1.

3,981,890

2-(N-THIOCARBAMOYL-N-SUBSTITUTED-AMINO)-3,4-METHYLENEDIOXY BENZHYDROLS

George A. Cooke, Denville, and William J. Houlihan, Mountain Lakes, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

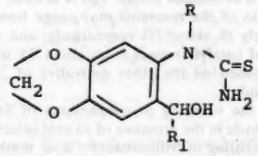
Division of Ser. No. 343,817, March 22, 1973, Pat. No. 3,875,093, which is a continuation of Ser. No. 141,011, May 6, 1971, abandoned. This application Jan. 20, 1975, Ser. No. 542,216

The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.

Int. Cl.[2] C07D *317/44*

U.S. Cl. 260—340.5 2 Claims

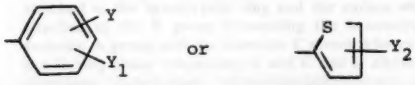
1. The compound of the formula:



in which

R is alkyl of 1 to 5 carbon atoms, cycloalkyl of 3 to 6 carbon atoms or cycloalkylalkyl in which the cycloalkyl portion is of 3 to 6 carbon atoms and the alkyl is straight chain alkyl of 1 to 3 carbon atoms, and

R_1 is



in which Y and Y_1 are the same or different and are hydrogen, fluoro, chloro, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, nitro or trifluoromethyl, provided that no more than one of Y and Y_1 are trifluoromethyl or nitro, or Y and Y_1 are on adjacent carbon atoms and together form a methylenedioxy, and Y_2 is hydrogen, fluoro, chloro or alkyl radical of 1 to 3 carbon atoms.

3,981,891

CYCLOPENTANONE DERIVATIVES, ODORIFEROUS COMPOSITIONS CONTAINING THEM AND PROCESS OF PREPARATION THEREOF

Charles Jerome Louis Celli, Eaubonne; Marcel Plattier, Antibes, and Paul Jose Teisseire, Grasse, all of France, assignors to Societe Anonyme Roure Bertrand Dupont, Paris, France

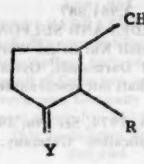
Continuation-in-part of Ser. No. 322,747, Jan. 11, 1973, Pat. No. 3,951,876. This application May 3, 1974, Ser. No. 466,702

Claims priority, application France, Jan. 18, 1972, 72.01509; July 17, 1973, 73.26210

Int. Cl.[2] C07C *49/28, 49/46;* C07D *317/72, 319/08*

U.S. Cl. 260—340.9 18 Claims

1. Cyclopentanone derivatives of the formula



in which R represents a hydrocarbon group of 3 to 7 carbon atoms, X represents a formyl, hydroxymethyl, lower alkoxymethyl, or lower alkylcarbonyl group and Y represents an oxo or ketal group,

with the proviso that R does not represent an n-pentyl group when, simultaneously, X represents a methylcarbonyl group and Y represents an oxo group.

3,981,892

POLYCYCLIC LACTONES AS ODOR- AND TASTE-MODIFYING AGENTS

Werner Skorianetz, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

Filed July 23, 1974, Ser. No. 491,032

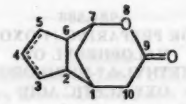
Claims priority, application Switzerland, Aug. 1, 1973, 11267/73

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.[2] C07D *493/00*

U.S. Cl. 260—343.2 R 4 Claims

1. A tricyclic lactone of formula



I

wherein one of the rings contains a single or a double bond in one of the positions indicated by the dotted lines.

3,981,893

2-AMINO-4 H-PYRANE

Horst Meyer; Friedrich Bossert, both of Wuppertal; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

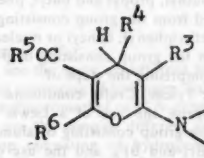
Division of Ser. No. 526,800, Nov. 25, 1974, which is a division of Ser. No. 375,809, July 2, 1973, Pat. No. 3,897,462. This application May 19, 1975, Ser. No. 578,465

Claims priority, application Germany, July 19, 1972, 2235406

Int. Cl.[2] C07D *309/22*

U.S. Cl. 260—345.8 5 Claims

1. A compound of the formula



wherein

R^1 and R^2 are the same or different and are each hydrogen or lower alkyl;

R^3 is lower alkyl;
R^4 is furyl unsubstituted or substituted by lower alkyl, halogen or lower alkoxy;
R^5 is —OR'' wherein R'' is lower alkyl, lower alkenyl or cycloalkyl of 3 to 7 carbon atoms; and
R^6 is hydrogen or lower alkyl.

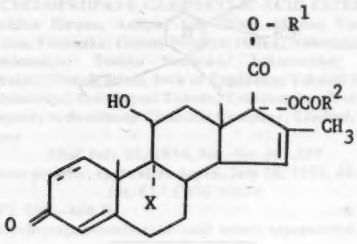
3,981,894

CHEMICAL COMPOUNDS

Gordon H. Phillipps, Wembley; Brian M. Bain, Chalfont St. Peter, and John C. Clark, Gerrards Cross, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed Aug. 29, 1975, Ser. No. 608,982
Claims priority, application United Kingdom, Aug. 30, 1974, 38089/74
Int. Cl.² C07J 3/00
U.S. Cl. 260—397.1 9 Claims

1. Compounds of the general formula



I

wherein R^1 represents a C_{1-4} alkyl or halo-C_{1-4} alkyl group, R^2 represents a methyl, ethyl, n-propyl or isopropyl group, X represents a hydrogen, chlorine or fluorine atom and — represents a single or double bond.

3,981,895

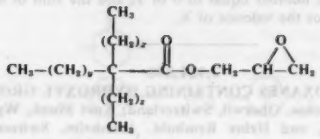
NOVEL AUTOXIDATIVE DERIVATIVES OF MALEINIZED MONOCARBOXYLIC FATTY ACID

Bruce Leary, Frankston, and Frederick John Lubbock, Beaumaris, both of Australia, assignors to Dulux Australia Ltd., Melbourne, Australia

Filed Nov. 29, 1974, Ser. No. 528,546
Claims priority, application Australia, Dec. 11, 1973, 5951/73
Int. Cl.² C09F 5/00, 7/00
U.S. Cl. 260—404.8 2 Claims

1. A derivative of an autoxidisable maleinised monocarboxylic fatty acid, said derivative being the product obtained by heating together:

a. an autoxidisable maleinised monocarboxylic fatty acid comprising the reaction product of 1 mol of maleic anhydride per mol of monocarboxylic fatty acid and
b. a diol selected from 2,2-bis (4-hydroxy cyclohexyl)propane and the reaction product of 1 mol of 2,2-bis (p-hydroxy phenyl)propane with 2 mol of an alkylene oxide selected from ethylene, propylene and butylene oxide, so as to form a mono-ester of said diol and open the maleic anhydride ring, and reacting the resulting ring-opened product by heating with
c. an alkylene oxide selected from ethylene, propylene and butylene oxide and a compound of the formula:



where x, y and z are integers and $x + y + z = 4–6$ inclusive, so as to obtain a mono-ester of said oxide (c), said derivative being characterised by having both carboxyl and hydroxyl groups, and an acid value of 40–100 KOH/gm and being further characterised by the presence of a mono-ester linkage of (b) and a mono-ester linkage of (c).

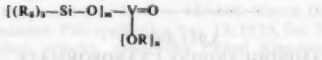
3,981,896

PHENYLSILOXY VANADIUM OXIDE CATALYSTS

Horst Pauling, Bottmingen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 248,046, April 27, 1974, Pat. No. 3,919,250. This application Feb. 21, 1975, Ser. No. 551,946
Claims priority, application Switzerland, Mar. 1, 1974, 2932/74
Int. Cl.² C07F 9/00
U.S. Cl. 260—429 R 12 Claims

1. Compounds of the general formula



(III)

wherein

R_6 is phenyl substituted, in one or more positions with an electron withdrawing group; R is selected from the group consisting of alkyl, cycloalkyl, lower alkyl substituted cycloalkyl, phenyl, phenyl lower alkyl, lower alkyl substituted phenyl; lower alkyl substituted phenyl lower alkyl, —Si $(R_6)_3$ and Si $(R_5)_3$; R_5 is selected from the group consisting of alkyl, phenyl lower alkyl, cycloalkyl, lower alkyl-substituted cycloalkyl, phenyl; lower alkyl-substituted phenyl-lower alkyl, and lower alkyl substituted phenyl; m is an integer from 1 to 3; and n is an integer of from 0 to 2 with the proviso that the sum of m and n is 3.

3,981,897

METHOD FOR MAKING CERTAIN HALONIUM SALT PHOTOINITIATORS

James V. Crivello, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 2, 1975, Ser. No. 574,007
Int. Cl.² C07F 9/66
U.S. Cl. 260—440 7 Claims

1. A method for making diarylhalonium salts of the formula,

$$[(R)_n(R^1)_bX]^+[YF_6]^-,$$

which comprises effecting contact under aqueous conditions between a diarylhalonium bisulfate salt of the formula,

$$[(R)_n(R^1)_bX]^+[HSO_4]^-,$$

and a Group VA alkali hexafluoro salt of the formula,

$$MYF_6$$

and thereafter recovering the diarylhalonium Group VA hexafluoride compound from the resulting mixture, where R is a monovalent aromatic group, R^1 is a divalent aromatic group, X is a halogen radical, M is an element selected from the class of hydrogen, alkali metal and alkaline earth metal, Y is selected from P, As and Sb, is a whole number equal to 0 or 2,

b is a whole number equal to 0 or 1, and the sum of a+b is equal to 2, or the valence of X.

3,981,898

POLYSILOXANES CONTAINING HYDROXYL GROUPS

Friedrich Lohse, Oberwil, Switzerland; Kurt Munk, Wyhlen, Germany, and Heinz Rembold, Arlesheim, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

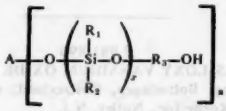
Filed Mar. 17, 1975, Ser. No. 558,996

Claims priority, application Switzerland, Mar. 25, 1974, 4107/74

Int. Cl.² C07F 7/18

U.S. Cl. 260—448.8 R 5 Claims

1. A polysiloxane of formula I



(I)

wherein A denotes a di- or three-valent aliphatic or cycloaliphatic-aliphatic residue with 2–15 C atoms in the molecule, R_1 and R_2 each denote a methyl, ethyl, propyl or phenyl, and wherein R_1 and R_2 on the same Si atom denote identical substituents and within the siloxane chain denote different substituents, R_3 denotes an alkylene with 2–6 C atoms, a lower alkyl-substituted alkylene with 2–6 C atoms in the alkylene chain, or a cycloaliphatic-aliphatic residue, n denotes the number 2 or 3 and x denotes a number from 2 to 20.

3,981,899

TRIAMINOGUANIDINE CYANOFORMATE

Milton B. Frankel, Tarzana, Calif., and Lionel A. Dickinson, Indian Head, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 25, 1968, Ser. No. 747,785

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² C07C 121/42

U.S. Cl. 260—465.5 R 3 Claims

1. $[(NH_2NH)_3C] + [C(CN)_3] -$

3,981,900

PREPARATION OF ALIPHATIC DINITRILES

Pierre Chabardès, Lyon; Pierre Gandilhon, Charly; Charles Grard, Lyon, and Michel Thiers, Rhone, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Continuation of Ser. No. 738,838, June 21, 1968, abandoned. This application Apr. 30, 1971, Ser. No. 139,204

Claims priority, application France, June 22, 1967, 67.111536

Int. Cl.² C07C 120/00, 121/20, 121/26

U.S. Cl. 260—465.8 D 9 Claims

1. In a process for converting acrylonitrile to its straight chain linear di-cyano dimer or its straight chain linear di-cyano hydrodimer which comprises dimerizing acrylonitrile in the presence of molecular hydrogen

at a temperature of 50°C to 120°C

under a hydrogen pressure of 1 to 50 bars and

in the presence of a catalyst selected from the group consisting of ruthenium salts of mineral and organic acids, complexes formed between a ruthenium halide and an electron donor and ruthenium chelate complexes,

the improvement which comprises

adding a catalyst activator to the reaction mixture in an amount of 1 to 25%, calculated as metal of the weight of the ruthenium introduced by said catalyst wherein said catalyst activator is selected from the group consisting of metallic ruthenium, metallic platinum, metallic nickel, metallic rhodium, RuO_2, $RuO(OH)_2$ and $Ru(OH)_3$.

3,981,901

NOVEL URETHANE POLYTHIOLS

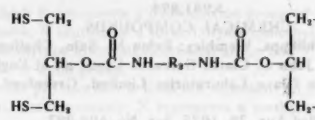
James Leverette Guthrie, Ashton, and Clifton Leroy Kehr, Silver Spring, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 546,709, Feb. 3, 1975. This application July 24, 1975, Ser. No. 598,594

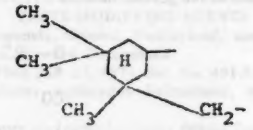
Int. Cl.² C07C 149/26

U.S. Cl. 260—468 E 1 Claim

1. A polythiol having the formula



in which R_2 is



3,981,902

5-OXA-17,18-DEHYDROPROSTAGLANDIN-$F_{1\alpha}$-TYPE ANALOGS

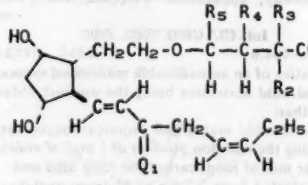
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 361,991, May 21, 1973, Pat. No. 3,931,279. This application Dec. 6, 1974, Ser. No. 530,234

Int. Cl.² C07C 61/28, 69/74, 177/00

U.S. Cl. 260—468 D 10 Claims

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein Q_1 is

or

wherein R_6 and R_7 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R_3 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro; wherein R_2 is hydrogen or fluoro, with the proviso that R_2 is fluoro only when R_3 is hydrogen or fluoro; and wherein R_4 and R_5 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different, with the proviso that no more than one of R_3, R_4, and R_5 is alkyl; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

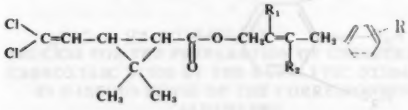
3,981,903

CYCLOPROPANE CARBOXYLIC ACID ESTERS

Masachika Hirano, Ashiya; Isao Ohno, Minoo; Yoshitoshi Okuno, Toyonaka; Osamu Magara, Osaka; Nobushige Itaya, Nishinomiya; Toshio Nishioka, Takarazuka; Toshio Mizutani; Nobuo Ohno, both of Toyonaka; Takashi Matsuo, Nishinomiya, and Hisami Takeda, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed July 25, 1974, Ser. No. 491,637
Claims priority, application Japan, July 28, 1973, 48-85223
Int. Cl.² C07C *69/74*
U.S. Cl. 260—468 H 6 Claims

1. Cyclopropanecarboxylic acid esters represented by the formula,



wherein R is a hydrogen atom, a halogen atom, a methyl or a methoxy group, and R_1 and R_2 are hydrogen atom, methyl group or a halogen atom.

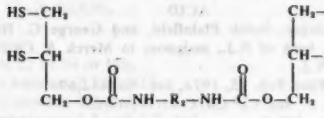
3,981,904

NOVEL URETHANE POLYTHIOLS

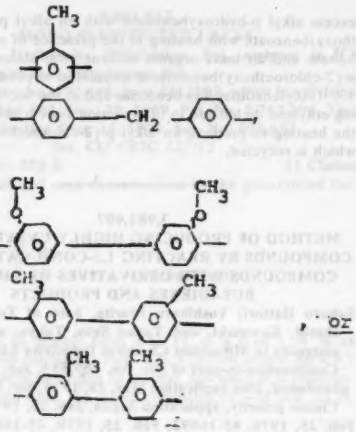
James Leverette Guthrie, Ashton, and Clifton Leroy Kehr, Silver Spring, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 546,709, Feb. 3, 1975, abandoned. This application July 24, 1975, Ser. No. 598,912
Int. Cl.² C07C *101/44*
U.S. Cl. 260—471 C 6 Claims

1. A polythiol having the formula



in which
R_3 is



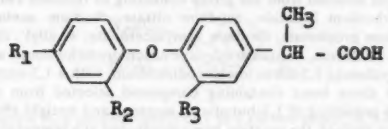
3,981,905

2-(SUBSTITUTED PHENYL) PROPIONIC ACIDS

Stewart Sanders Adams; Bernard John Armitage; John Stuart Nicholson, and James Gordon Tantum, all of Nottingham, England, assignors to Boots Pure Drug Company Limited, Nottingham, England

Continuation of Ser. No. 123,108, March 10, 1971, abandoned. This application Nov. 13, 1973, Ser. No. 415,319
Claims priority, application United Kingdom, Mar. 16, 1970, 12570/70
Int. Cl.² C07C *65/14, 101/447*
U.S. Cl. 260—473 R 6 Claims

1. A compound of the formula



in which R_1 is halogen; R_2 and R_3 are each selected from the group consisting of hydrogen and halogen, with the proviso that at least one of R_2 and R_3 is hydrogen; together with the pharmaceutically acceptable lower alkyl esters, inorganic salts and organic salts thereof.

3,981,906

PROCESS FOR PREPARING ALKYL 4,4'-(ETHYLENEDIOXY)BIS-BENZOATES

Yohei Fukuoka, Fuji; Toshio Kato, Kurashiki; Norio Imai, Fuji; Joji Nishikido, Fuji; Masato Hamada, Yokohama; Hiroshi Mikami, Chigasaki; Hirohumi Iwasaki, Moriyama, and Toshihisa Koike, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 7, 1975, Ser. No. 575,229
Claims priority, application Japan, May 9, 1974, 49-50713
Int. Cl.² C07C *69/76*
U.S. Cl. 260—473 R 9 Claims

1. In a process for preparing an alkyl 4,4'-(ethylenedioxy)-bis-benzoate comprising reacting an alkyl p-hydroxybenzoate and ethylene dichloride with a recycling alkyl p-(2-chloroethoxy)benzoate in the presence of an alkali carbonate, the improvement which comprises at the first step reacting an

excess alkyl p-hydroxybenzoate with an alkyl p-(2-chloroethoxy)benzoate with heating in the presence of an alkali carbonate and an inert organic solvent until almost said alkyl p-(2-chloroethoxy)benzoate is consumed to produce an alkyl 4,4'-(ethylenedioxy)bis-benzoate and at the second step adding ethylene dichloride to the reaction system and continuing the heating to produce an alkyl p-(2-chloroethoxy)benzoate which is recycled.

3,981,907

METHOD OF PRODUCING HIGHLY UNSATURATED COMPOUNDS BY REACTING 1,3-CONJUGATED DIENE COMPOUNDS WITH DERIVATIVES OF DIMERS OF BUTADIENES AND PRODUCTS

Saburo Hattori; Yoshiharu Morita, both of Tokyo; Yoshio Ihashi, Kawasaki, and Tadao Sato, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Japan

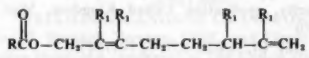
Continuation-in-part of Ser. No. 109,553, Jan. 25, 1971, abandoned. This application Mar. 18, 1975, Ser. No. 559,563

Claims priority, application Japan, Jan. 28, 1970, 45-7484; Feb. 25, 1970, 45-16092; Feb. 25, 1970, 45-16093; Mar. 6, 1970, 45-19136

Int. Cl.² C07C *67/28*

U.S. Cl. 260—488 H **12 Claims**

1. A method for the production of an alkapolyenyl group containing ester in which one molecule of a 1,3-conjugated diene bond containing compound is linked to an alkadienyl group of said ester and which has at least 12 carbon atoms and at least 3 carbon-carbon double bonds, characterized in that an alkadienyl ester represented by the formula



in which R is methyl, ethyl, propyl or phenyl and each R_1 is independently selected from the group consisting of hydrogen and methyl, is reacted in the presence of a rhodium compound catalyst selected from the group consisting of rhodium chloride, rhodium bromide, rhodium nitrate, rhodium acetate, rhodium propionate, rhodium acetylacetonate, π- allyl - rhodium chloride, tetrakis(ethylene)dischlorodirhodium and bis(cycloocta-1,5-diene)dichlorodirhodium, with a 1,3-conjugated diene bond containing compound selected from the group consisting of 1,3-butadiene, isoprene and straight-chain dimers thereof, the reaction being conducted at a temperature in the range of 50°–250°C.

3,981,908

PREPARATION OF GLYCOL ESTERS

Wolfgang Ganzler, Darmstadt-Arheilgen; Klaus Kabs, Seeheim, and Gunter Schröeder, Ober-Ramstadt, Darmstadt, all of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed Sept. 30, 1974, Ser. No. 510,613

Claims priority, application Germany, Nov. 12, 1973, 2356389

Int. Cl.² C07D *67/05*

U.S. Cl. 260—497 R **7 Claims**

1. In a process for preparing glycol esters in a liquid phase by the reaction of an olefin with oxygen and a carboxylic acid, the improvement wherein the reaction is carried out at a temperature from about 50° to 200°C. in the presence of a catalyst consisting essentially of:

A. a member selected from the group consisting of compounds of boron, aluminum, silicon, and phosphorus which are soluble in the liquid reaction medium, and

B. a member selected from the group consisting of compounds of iron and copper which are soluble in the liquid reaction medium,

at least one of the catalyst components being a halide.

3,981,909

PROCESS FOR PRODUCING PER-P-TOLUIC ACID AND UTILIZING THE SAME

Nobuo Isogai; Takashi Okawa, and Takako Takeda, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Mar. 27, 1975, Ser. No. 562,805

Claims priority, application Japan, Apr. 8, 1974, 49-40799; June 26, 1974, 49-73119; June 26, 1974, 49-73120

Int. Cl.² C07C *179/10*

U.S. Cl. 260—502 A **3 Claims**

1. A process for producing per-p-toluic acid, which comprises autooxidizing p-tolualdehyde, free of reaction inhibiting substances, in the form of a solution having a concentration of 10 to 50% by weight of p-tolualdehyde in a solvent of acetone or ethylacetate with a gas containing molecular oxygen, the autooxidation being conducted at a temperature of 10° to 50°C and under a pressure of 1 to 60 kg/cm² gage.

3,981,910

SULFUR CONTAINING TRIALKOXYBENZOYLAMINO CARBOXYLIC ACIDS

Heribert Offermanns, Grossauheim, and Klaus Posselt, Wachtberg-Villiprott, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

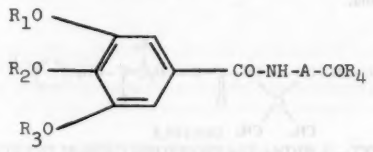
Filed May 8, 1974, Ser. No. 468,087

Claims priority, application Austria, May 15, 1973, 4232/73

Int. Cl.² C07C *147/13, 149/31*

U.S. Cl. 260—516 **14 Claims**

1. A compound of the formula



wherein:

A is alkylidene having 2 to 5 carbon atoms and which is substituted by alkyl thio having 1 to 4 carbon atoms or mercapto, at least two of R_1, R_2 and R_3 are alkyl of 1 to 5 carbon atoms and the other R_1, R_2 and R_3 is alkyl of 1 to 5 atoms, hydrogen or the acyl of alkanoic acid of 2 to 4 carbon atoms and R_4 is hydroxy or alkoxy with 1 to 5 carbon atoms and their pharmaceutically acceptable salts.

3,981,911

PROCESS FOR PREPARING (1-OXO-2-CYCLOPENTYL-2-METHYL-6,7-DICHLORO-5-INDANYLOXY)ACETIC ACID

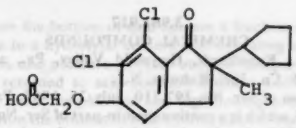
Meyer Sletzinger, North Plainfield, and George G. Hazen, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 15, 1974, Ser. No. 442,696

Int. Cl.² C07C *65/14, 69/95*

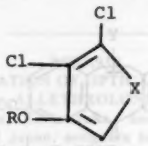
U.S. Cl. 260—520 C **6 Claims**

1. A process for preparing (1-oxo-2-cyclopentyl-2-methyl-6,7-dichloro-5-indanyloxy)acetic acid of the structure:



comprising the steps of

a. reacting under Diels-Alder conditions a conjugated diene of the structure:



and 5-cyclopentyl-5-methyl-2-cyclopentenone in a substantially inert solvent, at a temperature of from 20° to 300°C. and at a pressure of 1 to 10 atmospheres; and

b. aromatizing the adduct obtained from Step (a) with the elimination of X; wherein R is CH_2COOH, R′, or CH_2COOR' and wherein R′ is lower alkyl; phenyl or substituted phenyl, aralkyl or nuclear substituted aralkyl having from 7 to about 20 carbon atoms; and wherein X represents two hydrogen atoms, SO, SO_2, O, or NH in an inert solvent at a temperature of 25° to 300°C.; and

c. if R is R′ then hydrolyzing the resulting product from step (b) and treating with halo acetic acid to form the desired product and if R is CH_2COOR' hydrolyzing and acidifying the product of step (b) to obtain the desired product.

3,981,912

PROCESS FOR THE PREPARATION OF UNSATURATED CARBOXYLIC ACIDS BY THE CATALYTIC OXIDATION IN GASEOUS PHASE OF THE CORRESPONDING ALDEHYDES

Giancarlo Battiston, Baranzate (Milan); Guido Petrini, Milan; Giordano De Alberti, Besnate (Varese), and Romano Covini, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Nov. 7, 1975, Ser. No. 629,986
Claims priority, application Italy, Nov. 12, 1974, 29320/74
Int. Cl.² C07C *51/32*
U.S. Cl. 260—530 N **3 Claims**

1. A process for the preparation of acrylic acid or methacrylic acid, comprising reacting in vapor phase acrolein or methacrolein with molecular oxygen or an oxygen-containing gas, at a temperature between 200° and 350°C, in the presence of a solid catalyst, and with a contact time between 0.5 and 5 seconds, wherein the catalyst consists essentially of molybdenum, vanadium, tin, and one of the elements selected from the class consisting of chromium, nickel and manganese, and oxygen chemically combined with the above-indicated elements, the atomic ratios of the elements being represented by the empirical formula:

$$Mo_{12}V_aSn_bX_cO_d$$

wherein:

X is Cr or Ni or Mn;

a is between 0.5 and 10;

b is between 0.4 and 4;

c is between 0.3 and 3.5; and

d is a number that satisfies all the valency requirements of the other elements.

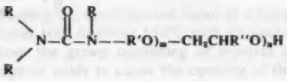
3,981,913

MONO-SUBSTITUTED UREAS

Kenneth H. Markiewitz, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Division of Ser. No. 372,445, June 21, 1973, which is a division of Ser. No. 880,892, Nov. 28, 1969, Pat. No. 3,763,106. This application Sept. 13, 1974, Ser. No. 505,652
Int. Cl.² C07C *127/15*
U.S. Cl. 260—553 R **11 Claims**

1. A substituted urea characterized by the generalized formula



wherein *n* is an integer from 2 to 14, *m* is 0 or 1, R′ is an alkylene group containing from 3 to 5 carbon atoms, each R″ is independently hydrogen or methyl, and each R is independently selected from the group consisting of —H and —CH_2OH.

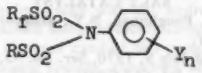
3,981,914

N-ALKYLSULFONYLPERFLUOROALKANESULFONANILIDES

Edward L. Mutsch, Woodbury Township, Washington County, and Joseph Kenneth Harrington, Edina, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 3, 1971, Ser. No. 168,736
Int. Cl.² C07C *143/74*
U.S. Cl. 260—556 F **10 Claims**

1. A compound of the formula



wherein R_f is perfluoroalkyl of 1 to 2 carbon atoms, R is lower alkyl or lower haloalkyl, Y is selected from halogen, nitro, cyano, alkyl, haloalkyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, alkanoyl, haloalkanoyl, alkanoylamino, haloalkanoylamino, alkylsulfinyl, haloalkylsulfinyl, alkylsulfonyl, haloalkylsulfonyl, alkylsulfonoxy and haloalkylsulfonoxy and *n* is 0–5, provided that the R and Y moieties contain not more than four carbon atoms each.

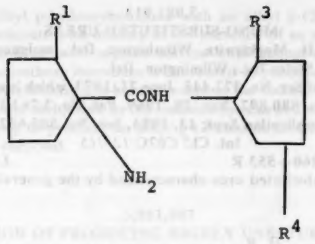
3,981,915

AMIDES OF 1-AMINOCYCLOPENTANE CARBOXYLIC ACID

Harvey E. Alburn, West Chester, and Norman H. Grant, Wynnewood, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 209,335, Dec. 17, 1971, Pat. No. 3,803,229. This application Aug. 6, 1973, Ser. No. 386,257
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl.² C07C *103/737*
U.S. Cl. 260—557 R **1 Claim**

1. An amide of 1-aminocyclopentanecarboxylic acid of the compound having the following formula:



wherein R^1 is selected from the group consisting of hydrogen, lower alkoxy, hydroxy, lower alkyl and nitro; R^3 is selected from the group consisting of hydrogen, lower alkyl, halogen and hydroxy and R^4 is either lower alkyl or hydrogen with the proviso that R^3 is either hydroxy or hydrogen when R^4 is lower alkyl; with the further proviso that R^1, R^3 and R^4 are not all hydrogen.

3,981,916

REDUCTION OF NITROPARAFFIN SUBSTRATES TO THEIR CORRESPONDING OXIMES USING A SILVER SALT CATALYST

John F. Knifton, Poughquag, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed July 9, 1970, Ser. No. 53,702

Int. Cl.² C07C *131/04*

U.S. Cl. 260—566 A **11 Claims**

1. A process for reducing mixtures of mono-nitrated paraffin substrates containing 3 to 40 carbon atoms, to the corresponding paraffinone oxime products without producing substantial quantities of the fully reduced paraffinic amines, consisting essentially of:

a. forming a homogenous reaction mixture of the following components in the proportions indicated:
   1. a molar equivalent of said mono-nitroparaffins to be reduced,
   2. from about 1 to 100 molar equivalents of a water-miscible nitrogenous base selected from the group consisting of monodentate amines, bidentate amines and multidentate amines, said base having a pKa strength between about 9.5 to 11.5, and being capable of solubilizing or chelating silver salts,
   3. from about 0.1 to 2 molar equivalents of silver salt said silver salt being selected from the group consisting of silver salts of mineral acids and silver salts of organic acids, said silver salts being soluble in said nitrogenous base, and
   4. from 0 to 100 molar equivalents of water;

b. heating said reaction mixture at temperatures ranging from about 40° to 120°C, in the presence of a carbon monoxide atmosphere, at superatmospheric pressures ranging from about 300 psig to 1000 psig, until substantially all of the said mono-paraffins are reduced to the corresponding paraffinone oxime products, and

c. isolating the paraffinone oximes contained therein.

3,981,917

CHEMICAL COMPOUNDS

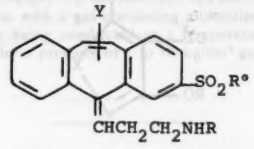
Edward L. Engelhardt, Gwynedd Valley, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

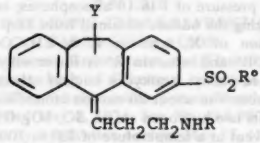
Division of Ser. No. 297,710, July 25, 1963, Pat. No. 3,922,305, which is a continuation-in-part of Ser. No. 215,770, Aug. 9, 1962, abandoned, which is a continuation-in-part of Ser. No. 140,223, Sept. 25, 1961, abandoned, which is a continuation-in-part of Ser. No. 120,835, May 24, 1961, abandoned. This application Apr. 11, 1975, Ser. No. 567,157

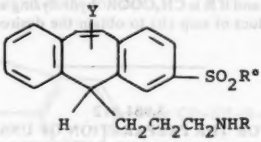
Int. Cl.² C07C *87/28, 87/29*

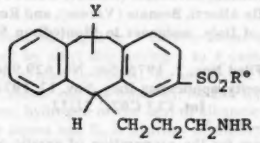
U.S. Cl. 260—570.8 TC **5 Claims**

1. A compound selected from the group consisting of









and the non-toxic acid addition salts thereof; wherein R° is a lower alkyl, R is a lower alkyl, and Y is hydrogen.

3,981,918

ISOPHORONE PRODUCTION USING A POTASSIUM HYDROXIDE CATALYST

John Reginald Walton, Hull, and Bertram Yeomans, Hessle, both of England, assignors to BP Chemicals International Limited, London, England

Filed Apr. 21, 1975, Ser. No. 570,175

Claims priority, application United Kingdom, May 15, 1974, 21651/74

Int. Cl.² C07C *45/00*

U.S. Cl. 260—586 C **3 Claims**

1. A process for the production of isophorone by feeding a mixture of acetone, water and an alkali to an intermediate point in a reaction column operating at elevated temperature and pressure and under an acetone/water azeotrope reflux,

passing from the bottom of said column a fraction containing isophorone to a hydrolysis column also operating at elevated temperature and pressure wherein acetone is separated overhead and returned to said reaction column and a fraction containing water, isophorone and high-boiling compounds is removed from the bottom of said hydrolysis column and thereafter isophorone is recovered from said bottom fraction wherein the invention comprises feeding a mixture consisting of 65 to 85% w/w acetone, 35 to 15% w/w water and 0.7 to 0.3% w/w potassium hydroxide to said intermediate point in said reaction column at such a rate as to maintain an acetone/water azeotrope reflux having a potassium hydroxide concentration in the range 300 to 1000 ppm within said reaction column.

3,981,919
RACEMIZATION OF OPTICALLY ACTIVE ALLETHROLONE

Takeaki Umemura, Takarazuka, and Fukashi Horiuchi, Kawani, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 22, 1975, Ser. No. 542,904
Claims priority, application Japan, Jan. 25, 1974, 49-11314
Int. Cl.² C07C *45/00*; C07B *20/00*; C07C *29/00*
U.S. Cl. 260—586 R **8 Claims**

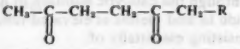
1. A process for preparing racemic allethrolone which comprises reacting (−) allethrolone with a phosphorus chloride compound selected from the group consisting of phosphorus trichloride, phosphorus pentachloride, phosphorus oxychloride, triphenylphosphite dichloride, diphenyltrichlorophosphorane, and triphenylphosphine dichloride, in the presence of a Lewis acid, separating the 4-chloro-allethrolone and hydrolyzing racemic 4-chloro-allethrolone thus obtained in the presence of a weak base.

3,981,920
METHOD FOR PREPARING CYCLOPENTENONE DERIVATIVES

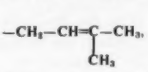
George Hermann Buchi, Cambridge, Mass., assignor to Firmenich S.A., Geneva, Switzerland

Continuation of Ser. No. 436,680, March 2, 1965, abandoned. This application May, 1968, Ser. No. 728,050
Claims priority, application Switzerland, Mar. 3, 1974, 2638/64
Int. Cl.² C07C *49/12*
U.S. Cl. 260—593 R **8 Claims**

1. A process for the preparation of a dione of the formula



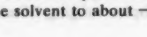
wherein R represents a member selected from the group consisting of $-CH_2-CH=CH_2$, $-CH_2-CH=CH-CH_3$,



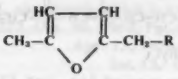
$-CH_2-CH=CH-CH_2-CH_3$, $-CH_2-CH_2-CH=CH-CH_3$, $-CH_2-CH_2-CH_2-CH=CH_2$ and $-CH_2-CH=CH-CH=CH_2$ which comprises

a. metallating 2-methylfuran in the 5-position by an interchange reaction with an alkali metal-organic compound selected from the group consisting of lower alkyl sodium, lower alkyl lithium, phenyl sodium, phenyl lithium, benzyl sodium and benzyl lithium, said step being conducted in an inert atmosphere and in an organic solvent medium at a temperature of from about 60°C to about −30°C;

b. condensing the resulting metal derivative of 2-methylfuran in an organic solvent medium, in an inert atmosphere and at a temperature of from the reflux temperature of the solvent to about −30°C with a halide of the formula



wherein R has the previously indicated significance in order to form a 2,5-disubstituted furan of the formula



and,

c. treating the disubstituted furan at a temperature of from about 100° to about 150°C with an aqueous acid selected from the group consisting of mineral acids and strong organic acids to cause the opening of the furan ring.

3,981,921
PROCESS FOR PRODUCING KETONES

Gerd Bohmholdt, Westerholt; Hinrich Husemann, Marl, and Helmut Riedel, Gelsenkirchen-Buer, all of Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Filed Dec. 21, 1970, Ser. No. 100,339
Claims priority, application Germany, Dec. 27, 1969, 1965186
Int. Cl.² C07C *45/00*
U.S. Cl. 260—586 R **9 Claims**

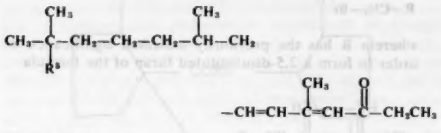
1. In a process for the oxidation of olefins to ketones by hydration at a temperature of 80° to 160°C and a pressure between 10 and 100 atmospheres followed by dehydrogenation at a temperature between 130° and 180°C of the secondary alcohols formed, the improvement which comprises carrying out simultaneously with the hydration an organic liquid phase extraction using the olefin starting material therefor on a fixedly disposed catalyst bed composed of acid organic ion exchangers thereby absorbing secondary alcohol and ether by-product formed, separating said liquid phase extract from the hydration reaction mixture, separating said secondary alcohol and ether from said liquid phase and thereafter feeding said secondary alcohol-ether mixture to a dehydrogenation step during which said ether is separated by purging.

3,981,922
DI-OLEFINIC KETONES

Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 201,167, Nov. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 187,898, Oct. 8, 1971, Pat. No. 3,752,843, which is a continuation-in-part of Ser. No. 111,701, Feb. 1, 1971, abandoned. This application May 9, 1974, Ser. No. 468,350
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² C07C *49/20*
U.S. Cl. 260—593 R **3 Claims**

1. A compound of the formula:



in which R^5 is hydrogen or methyl.

3,981,923

DEHYDROGENATION OF ALCOHOLS TO KETONES

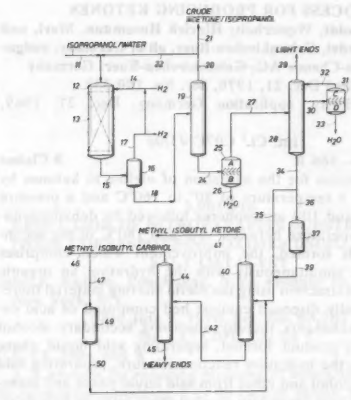
Bernhard Stouthamer, and Arien Kwantes, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 44,051, June 8, 1970, Pat. No. 3,875,239. This application Sept. 16, 1974, Ser. No. 506,623

Claims priority, application Netherlands, June 11, 1969, 6908875

Int. Cl.² C07C *45/16*

U.S. Cl. 260—596 **3 Claims**



1. A process for converting an acyclic aliphatic secondary monoalcohol having from 3 to 6 carbon atoms into an aliphatic ketone having the same number of carbon atoms as the secondary monoalcohol which comprises passing the monoalcohol over a catalyst consisting essentially of from 0.01% by weight to 1% by weight of platinum on a non-acidic porous alumina support having an average pore diameter of greater than 250A and a specific surface area from about 5 to 100 m^2/g at a temperature of from 250° to 400°C and a pressure of from 1 atmosphere to 5 atmospheres.

3,981,924

DIELS-ALDER ADDUCT PRODUCT

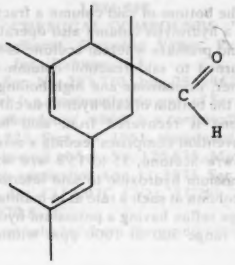
John B. Hall, Rumson, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 462,750, April 22, 1974, Pat. No. 3,929,895. This application June 26, 1975, Ser. No. 590,473

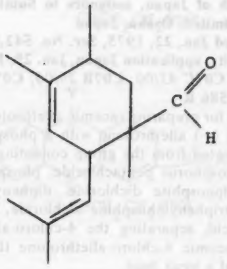
Int. Cl.² C07C *47/45*

U.S. Cl. 260—598 **1 Claim**

1. A composition consisting essentially of a mixture of chemical compounds having the structures:



and



3,981,925

SELECTIVE HYDROFORMYLATION PROCESS USING HOMOGENEOUS CATALYSTS

Irving Schwager, Lompoc, Calif., and John F. Knifton, Poughquag, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed May 8, 1972, Ser. No. 251,639

Int. Cl.² C07C *45/08*

U.S. Cl. 260—604 HF **11 Claims**

1. A process for preparing primarily linear aldehyde products by the hydroformylation of alpha olefins containing from 2 to 30 carbon atoms, through the catalytic addition of hydrogen and carbon monoxide to said olefins at elevated temperatures and pressures consisting essentially of:

a. admixing each mole of said alpha olefin to be hydroformylated with from 0.001 to 0.1 millimoles of a ligand stabilized platinum dihalide complex selected from the group consisting of:

$PtCl_2[Ph_2PCH_2CH_2PPh_2]$
$PtCl_2[P(n\text{-}Bu)_3]_2$
$PtCl_2[PPh(CH_3)_2]_2$
$PtCl_2[P(p\text{-}CH_3.C_6H_4)_3]_2$
$PtCl_2[P(OPh)_3]_2$
$PtCl_2[PCl(Ph)_2]_2$
$PtCl_2(PPh_3)_2$
$PtCl_2(AsPh_3)_2$
$PtCl_2(Ph_2AsCH_2CH_2AsPh_2)$
$PtCl_2(SbPh_3)_2$
$PtCl_2$(o-Phenanthroline)
$PtCl_2(SPh_2)_2$
$PtBr_2(PPh_3)_2$ and
$PtCl_2(PPh_3)_2$

catalyst complex, and from 0.001 to 1.0 moles of a Group IVA metal halide selected from the group consisting of $SnCl_4$, $SnCl_2$ and $GeCl_2$, said mole ratio of Group IVA halide ligand stabilized platinum II dihalide complex ranging from 1:1 to

10:1, in a deoxygenating atmosphere to form a deoxygenated reaction admixture,

b. pressurizing said reaction admixture between about 100 and 3000 psig with an excess of carbon monoxide and hydrogen over what is required by stoichiometry to satisfy the needs of aldehyde-forming hydroformylation reaction, said mole ratio of H_2:CO ranging from 0.033 to 30 moles of hydrogen for each mole of carbon monoxide,

c. heating said pressurized reaction admixture between 25°C to 125°C, until formation of said aldehyde products takes place, and

d. isolating said aldehyde product contained therein.

3,981,926

PURIFICATION OF SOLID ORGANIC PEROXIDES

Jan van Holten, Zwijndrecht, and Cornelis Ribbens, Dordrecht, both of Netherlands, assignors to N.V. Chefaro Maatschappij, Rotterdam, Netherlands

Filed Mar. 3, 1969, Ser. No. 803,841

Claims priority, application Netherlands, Mar. 4, 1968, 6803015

Int. Cl.² C07C *179/14*

U.S. Cl. 260—610 D **5 Claims**

1. In the method of purifying an impure aliphatic diacyl peroxide which is solid at normal temperature and has a melting point below 120°C. and which has unreacted acid chloride, free fatty acid and/or alkali salts present as impurities therewith, comprising the steps of heating an aqueous suspension of said impure aliphatic diacyl peroxide to a temperature above said melting point for converting said suspension to an aqueous emulsion of the melted peroxide and then separating the resulting aqueous phase containing said impurities and the liquid peroxide phase by means of a centrifugal separator, whereupon the separated peroxide phase consisting essentially of the purified aliphatic diacyl peroxide is solidified by cooling to below said melting point; the improvement of effecting said heatng of the aqueous suspension of the impure aliphatic diacyl peroxide by injecting finely divided steam, at a pressure between 2 and 5 atmospheres and a temperature between 120° and 150°C., respectively, into said suspension during its continuous transport, with a linear speed in the range between 0.5 and 2.0m/sec., in at least one path leading to said separator so as to avoid any substantial decomposition of said peroxide therein.

3,981,927

1,2,2,2-TETRAFLUOROETHYL ETHERS AND PROCESS FOR PREPARING THEM

Günther Siegemund, Hofheim, Taunus, and Roman Muschaweck, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 8, 1974, Ser. No. 495,897

Claims priority, application Germany, Aug. 10, 1973, 2340560

Int. Cl.² C07C *43/00, 43/12*

U.S. Cl. 260—614 F **3 Claims**

1. A 1,2,2,2-tetrafluoroethyl ether of the formula

$$CF_3CHF—O—R,$$

wherein R is methyl or ethyl.

3,981,928

PERFLUOROTERTIARYALKYL ETHERS

Frank J. Pavlik, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 538,556, March 30, 1966, abandoned, which is a continuation-in-part of Ser. No. 246,022, Dec. 20, 1962, abandoned, which is a continuation-in-part of Ser. No. 234,222, Oct. 30, 1962, Pat. No. 3,385,904. This application Apr. 13, 1970, Ser. No. 32,477

Int. Cl.² C07C *43/12*

U.S. Cl. 260—615 F **2 Claims**

1. A monohydroxyalkyl, perfluorotertiaryalkyl ether, said monohydroxyalkyl group having no more than 16 carbon atoms and said perfluorotertiaryalkyl group having the structure

where R_f is a perfluoroalkyl radical of less than 10 carbon atoms.

3,981,929

METHOD OF SEPARATING METHYLOLPHENOLS FROM SOLUTIONS

Robert Elliott Davis, Oklahoma City, Okla., and Friedrich Josef Weck, Hacienda Heights, Calif., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. Nos. 716,337, March 27, 1968, abandoned, and Ser. No. 321,046, Jan. 4, 1973, abandoned. This application May 16, 1974, Ser. No. 470,348

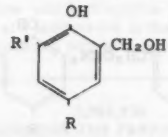
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C07C *39/06, 39/27*

U.S. Cl. 260—621 K **9 Claims**

1. A method of separating methylolphenol from a phenolic impurity which comprises:

contacting (A) an organic solution containing (1) an organic solvent; (2) at least one phenolic impurity and (3) about 1% to about 20% by weight of the methylolphenol having the formula



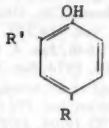
in which R is selected from the group consisting of hydrogen, phenyl, bromine, chlorine and alkyl radicals having from 3 to 8 carbon atoms and R′ is selected from the group consisting of hydrogen, phenyl, chloro, CH_2OH and alkyl radicals having from 1 to 9 carbon atoms

with (B) an aqueous alkaline borate solution containing lithium ions and being free of substantial amounts of other alkali metal ions, for a period of time sufficient for a solid complex of lithium and boron to form with said methylolphenol, the organic solution being contacted with said aqueous alkaline borate solution for at least about 0.5 hour at a temperature of between about 20° and about 40°C. and thereafter contacting said solid complex with a dilute inorganic acid and an organic solvent for said methylolphenol to dissolve said complex and provide an aqueous phase containing the lithium and boron values of said complex and an organic phase containing the methylolphenol portion of said complex and separating said phases, the concentration of lithium and boron ions in the alkaline borate solution being sufficient to provide

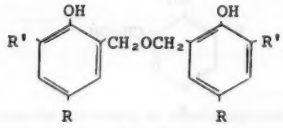
at least about one lithium ion and one boron ion for every two moles of said methylolphenol in said organic solution; said organic solvent being selected from the group consisting of benzene, toluene, xylenes, alkyl benzene, hexane, heptane, octane, nonane, kerosene, mineral spirits, petroleum ether, butyl ether, isopropyl ether, hexyl ethers, chloroform, carbon tetrachloride, chlorobenzene, monohydric alcohols having from 8 to 17 carbon atoms per molecule and mixtures thereof and said phenolic impurity being at least one member of the group consisting of

a. unreacted starting materials having the formula

b. partially reacted starting materials having the formula

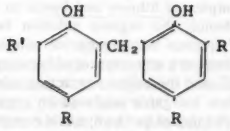


c. degradation products of the methylolphenol having the formula



and

d. degradation products of the methylolphenol having the formula



in which R and R′ in each instance are as hereinbefore defined for the methylolphenol.

3,981,930

DIACETYLENE DIOL DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Takashi Nishida; Yoichi Ninagawa, both of Kurashiki; Yoshiaki Omura, Okayama; Fumio Mori; Yoshin Tamai, both of Kurashiki; Takeo Hosogai, Okayama; Yoshiji Fujita, and Kazuo Itoi, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Okayama, Japan

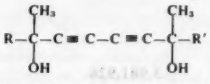
Division of Ser. No. 448,700, March 6, 1974, Pat. No. 3,923,918. This application May 1, 1975, Ser. No. 573,569

Claims priority, application Japan, Mar. 19, 1973, 48-32274; Jan. 14, 1974, 49-7268; Jan. 14, 1974, 49-7269

Int. Cl.[2] C07C *33/04*

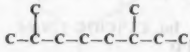
U.S. Cl. 260—635 Y **6 Claims**

1. A compound having the general formula



(I)

wherein R and R′ are the same or different and represent saturated or unsaturated hydrocarbon residues having 11 carbon atoms represented by the following carbon atom skeleton:



3,981,931

DIOLS BY TRANSESTERIFICATION USING MAGNESIA CATALYSTS

William E. Smith, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Mar. 13, 1974, Ser. No. 450,587

Int. Cl.[2] C07C *29/00, 27/00*

U.S. Cl. 260—635 R **7 Claims**

1. A process for preparing diols which comprises reacting an alkane diol acetate with a lower alkanol in the presence of a transesterification catalyst selected from the group consisting of mixtures of magnesium oxide and magnesium hydroxide and mixtures of magnesium oxide, magnesium hydroxide and manganese oxide at a temperature of from about 100°C to about 250°.

3,981,932

ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF

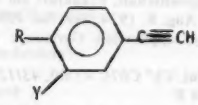
Julius Diamond, Morris Plains, N.J., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 493,590, Aug. 1, 1974, Pat. No. 3,898,292. This application May 14, 1975, Ser. No. 574,797

Int. Cl.[2] C07C *79/10*

U.S. Cl. 260—645 **8 Claims**

1. A compound of the formula



where R is alkyl having 3–7 carbon atoms or cycloalkyl having 5–7 ring carbon atoms and Y is iitro.

3,981,933

PROCESS FOR MAKING DINITROTOLUENE

Newell C. Cook, Schenectady, and Gary C. Davis, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 486,356, July 8, 1974. This application Aug. 18, 1975, Ser. No. 605,398

Int. Cl.² C07C 79/10

U.S. Cl. 260—645 1 Claim

1. The process for making dinitrotoluene which comprises (1) forming a solution of toluene in methylene chloride, (2) adding a mixture of concentrated sulfuric acid having a concentration of at least 90% and concentrated nitric acid of at least 90% concentration to the methylene chloride solution at a temperature of from 42° to 45°C., the said acid being close to the stoichiometric amount required to attach two nitro groups to the toluene, and (3) extracting the dinitrotoluene from the reaction mixture with additional methylene chloride.

3,981,934

METHOD FOR DRYING TRINITROTOLUENE

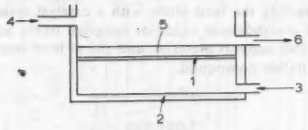
Odd Riiber, Gullaug pr. Drammen, Norway, assignor to Dyno Industrier A.S., Oslo, Norway

Filed Sept. 19, 1974, Ser. No. 507,781

Claims priority, application Norway, Sept. 20, 1973, 3698/73

Int. Cl.² C07C 79/10; F26B 7/00

U.S. Cl. 260—645 4 Claims



1. A method of drying melted aqueous trinitrotoluene, said method comprising:

continuously passing a layer of melted aqueous trinitrotoluene over a porous surface while maintaining the height of said layer no more than 4.5 cm;

simultaneously forcing hot air upwardly through said porous surface and said melted trinitrotoluene thereby drying said melted trinitrotoluene; and

said step of passing said melted aqueous trinitrotoluene over said porous surface being carried out at a speed such that the drying time of said melted aqueous trinitrotoluene is approximately 2.5 minutes.

3,981,935

AZEOTROPIC NITRATION OF BENZENE

Robert McCall, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 10, 1975, Ser. No. 639,875

Int. Cl.² C07C 79/10

U.S. Cl. 260—645 15 Claims

1. In a two-stage continuous process for the mononitration of benzene having a first stage comprising the steps of

feeding fresh benzene and nitric acid in about stoichiometric proportions to produce nitrobenzene into a first-stage reaction vessel containing nitrobenzene, benzene and sulfuric acid;

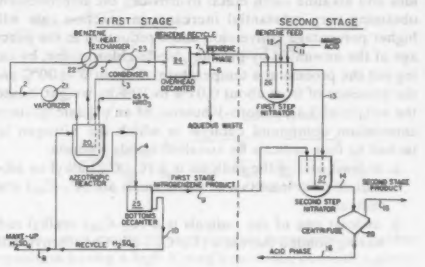
mixing the ingredients in the reaction vessel and reacting benzene and nitric acid at a temperature in the range of about 120° to 160°C.;

vaporizing an azeotrope of a water phase containing nitric acid and a hydrocarbon phase containing benzene and nitrobenzene, and removing the azeotrope from the reaction vessel;

condensing the azeotrope and separating the aqueous phase from the hydrocarbon phase;

feeding excess benzene into the reaction vessel to maintain the total input of benzene to the reaction vessel above stoichiometric relative to the nitric acid fed thereto and to enhance the vaporization of the azeotrope, said excess benzene being either recycle stream of the hydrocarbon phase from the condensed azeotrope, or fresh benzene, or a combination of both; and

withdrawing from the reaction vessel a mixture of acids and a first-stage nitrobenzene product phase, separating the nitrobenzene product phase



and recycling the acids to the reaction vessel;

with the sulfuric acid concentration in the reaction vessel being controlled within the range of 55 to 70 percent by weight relative to the sulfuric acid plus water present by adjusting one or more of the reaction temperatures and the rates of feeding nitric acid and benzene to the reaction vessel;

the improvement of feeding to at least one second-stage reaction vessel at least about half of the hydrocarbon phase separated from the aqueous phase of the azeotrope, said second-stage reaction vessel containing nitrobenzene, benzene, nitric acid and sulfuric acid, wherein the benzene from said hydrocarbon phase is reacted with nitric acid at a temperature in the range of about 65° to 75°C. to produce a second-stage nitrobenzene product.

3,981,936

METHOD FOR THE PREPARATION OF BIS-(BROMOMETHYL)-TETRACHLOROBENZENES AND THEIR USE AS FLAME-PROOFING AGENTS

Egon Petersen, Neunkirchen-Seelscheid; Werner Schmidt, St. Augustin, and Klaus-Dieter Steffen, Troisdorf-Oberlar, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Mar. 27, 1974, Ser. No. 455,153

Claims priority, application Germany, Mar. 31, 1973, 2316204

Int. Cl.² C07C 25/14

U.S. Cl. 200—651 R 11 Claims

1. A process for preparing a bis-(bromomethyl)-tetrachlorobenzene which comprises contacting a bis-(chloromethyl)-tetrachlorobenzene at a temperature between 20° and 180°C with a bromide of an element of group 1 to group 3 inclusive of the periodic system or hydrogen bromide in a solvent for said bis-(chloromethyl)-tetrachlorobenzene in which solvent the corresponding bis-(bromomethyl)-tetrachlorobenzene is substantially insoluble, said solvent being selected from the group consisting of alcohols, ethers and ketones.

3,981,937

DEHYDROHALOGENATION OF 3,4-DICHLORO-1-BUTENE

John B. Campbell, and Robert Edward Tarney, both of Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 633,435, April 25, 1967, abandoned, which is a continuation-in-part of Ser. No. 554,978, June 3, 1966, abandoned. This application Feb. 13, 1970, Ser. No. 11,351

Int. Cl.[2] C07C *21/20*

U.S. Cl. 260—655 **22 Claims**

1. In a process for directly producing 2-chloro-1,3-butadiene by reacting 3,4-dichloro-1-butene with an aqueous solution containing at least about 15% by weight of alkaline material selected from the group consisting of alkali metal hydroxides and alkaline earth metal hydroxides the improvement of obtaining very substantial increases in reaction rate with a higher percentage conversion and a reduction in the percentage of the unwanted by-product, alpha-chloroprene, by carrying out the process at a temperature of about 0°–100°C and in the presence of from about 0.01% to 10% by weight, based on the weight of 3,4-dichloro-1-butene, of an organic quaternary ammonium compound catalyst in which the nitrogen is attached to four radicals by covalent bonds wherein:

a. at least one of the radicals is a (C_6–C_{20}) alkyl or alkenyl radical or at least two of the radicals are (C_7–C_{20}) aralkyl radicals, or

b. at least one of the radicals is a (C_7–C_{20}) aralkyl radical having bonded thereto a (C_6–C_{20}) alkyl or alkenyl radical, or

c. at least one radical is an alkyl, alkenyl, or aralkyl radical containing up to 20 carbon atoms and containing a hydroxy or ether group in a position beta to the nitrogen, and

d. the remaining radicals are (C_1–C_{20}) alkyl or alkenyl radicals, or (C_7–C_{20}) aralkyl radicals.

3,981,938

METHOD FOR PRODUCING DRY ALKYL HALIDES

John M. Steele; Fredric M. Hanak, both of Lake Jackson; Guillermo J. Nino, Houston, and John E. Panzarella, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 8, 1974, Ser. No. 486,541

Int. Cl.[2] C07C *17/16*

U.S. Cl. 260—657 **7 Claims**

1. A method for producing substantially dry C_{1-4} alkyl halides which comprises reacting the corresponding C_{1-4} alkanol with at least 10% excess over stoichiometry of hydrogen halide at a temperature of at least 50°C. to about 180°C under 25 to 400 psig. pressure to maintain a substantial portion of the water of reaction in the liquid phase; withdrawing the organic halide-hydrogen halide vapor phase from the reaction zone, and contacting the same with a descending stream of organic halide-hydrogen halide liquid reflux; withdrawing the vapors from said contacting zone in a dry state; and separating the organic halide from the hydrogen halide.

3,981,939

HYDROCHLORINATION OF VINYLIDENE CHLORIDE TO PRODUCE METHYL CHLOROFORM

Walter Lobunez, Princeton, and Sidney Berkowitz, Highland Park, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 886,071, Dec. 18, 1969, abandoned. This application June 13, 1975, Ser. No. 586,782

Int. Cl.[2] C07C *17/04*, *17/08*

U.S. Cl. 260—658 R **4 Claims**

1. The method of hydrochlorinating vinylidene chloride to produce methyl chloroform, which comprises continuously introducing into the reactor vinylidene chloride and hydrogen chloride concurrently into a liquid body of an anhydrous carrier, of the group consisting of 1,1,2-trichloroethane and perchloroethylene, containing suspended in it a hydrochlorination catalyst, at a temperature below 75°C, and maintaining the reactants in contact with the liquid body until a major portion of the vinylidene chloride has been converted to methyl chloroform, and continuously withdrawing from said reactor a mixture including methyl chloroform, catalyst and carrier, separating methyl chloroform from catalyst and carrier and returning catalyst and carrier to the liquid body to maintain the liquid body at a steady volume.

3,981,940

SOLID OLEFIN REACTION CATALYST AND METHOD OF USING SAME

Ernest A. Zuech, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 816,052, April 14, 1969, Pat. No. 3,940,346. This application July 23, 1975, Ser. No. 598,525

Int. Cl.[2] C07C *3/62*

U.S. Cl. 260—683 D **30 Claims**

1. A process for converting at least one feed olefin hydrocarbon in accordance with the olefin reacton which comprises contacting the feed olefin with a catalyst system comprising (a) molybdenum oxide or tungsten oxide associated with a suitable support material, and (b) at least one organoaluminum compound, wherein the (a) component of the catalyst system is treated with nitric oxide, nitrosyl halide, or an inorganic base material prior to contact with (b).

12. A process for converting at least one feed olefin hydrocarbon in accordance with the olefin reaction which comprises contacting the feed olefin with a catalyst system comprising (a) molybdenum oxide or tungsten oxide associated with a suitable support material, and (b) at least one organoaluminum halide compound.

3,981,941

PROCESS OF MAKING LINEAR ALPHA-OLEFINS BY ETHYLENE OLIGOMERIZATION

Stephen Allan Butter, East Windsor, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,531

Int. Cl.[2] C07C *3/20*

U.S. Cl. 260—683.15 D **15 Claims**

1. In a process for oligomerizng ethylene to linear alpha-olefins utilizing a titanium halide-organoaluminum halide oligomerization catalyst, the improvement comprising carrying out said process in the presence of a halogenated phosphorus compound of the following general formula:

$$(R)_yP(X)_{n-y}$$

in which X is halogen, n is 1–5 and R is aryl with y being 0, 1 or 2 thereby enhancing control of the product oligomers to a narrow molecular weight range of linear alpha-olefins.

3,981,942

HF ALKYLATION PROCESS AND REACTION TEMPERATURE CONTROL SYSTEM

Robert F. Zabransky, Oak Brook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 534,399, Dec. 19, 1974, which is a continuation-in-part of Ser. No. 468,955, May 10, 1974, Pat. No. 3,948,603. This application Aug. 7, 1975, Ser. No. 602,947

Int. Cl.[2] C07C *3/54*

U.S. Cl. 260—683.48 **6 Claims**

1. A process for alkylating an isoparaffin with an olefinic feed stream, containing at least two olefins, which process comprises the steps of:

a. reacting said isoparaffin with said feed stream, in admixture with a hydrogen fluoride catalyst, in an alkylation

reaction zone, at alkylating conditions resulting in a reaction product effluent containing normally liquid alkylate;

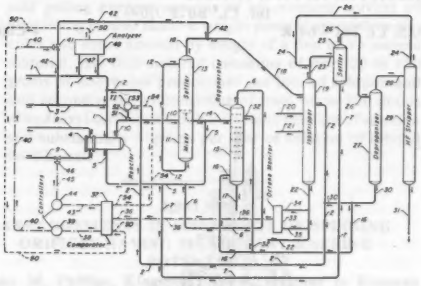
b. regulating the temperature of the reaction mixture, within said reaction zone, through indirect contact of said reaction mixture with a cooling medium passing through conduit means through said reaction zone, the flow of said cooling medium being adjusted by first flow-varying means connected to said conduit means;

c. separating said reaction product effluent into a hydrocarbon phase and an acid phase;

d. recycling a first portion of said hydrocarbon phase to said reaction zone, the flow of said first portion of hydrocarbon phase being adjusted by second flow-varying means connected to the recycle conduit to said reaction zone;

e. recovering said normally liquid alkylate from a second portion of said hydrocarbon phase;

f. introducing a sample of said olefinic feed stream prior to reacting step (a) into a first hydrocarbon analyzer and developing therein a first process output signal representative of a composition characteristic of said olefinic feed stream;



g. sensing a reaction zone temperature and developing a second process output signal representative of said temperature;

h. introducing a sample of said alkylate into a second hydrocarbon analyzer and developing therein a third process output signal which is representative of a composition characteristic of said sample;

i. transmitting said first, said second and said third process output signals to comparator means and developing therein a computer output signal in response to and as a function of said three process output signals; and,

j. transmitting said computer output signal to said first and said second flow-varying means, whereby the rate of flow of said cooling medium passing through conduit means through said reaction zone and the rate of flow of said recycled hydrocarbon phase passing through the recycle conduit to said reaction zone are adjusted in response to and as a function of said three process output signals.

3,981,943

RUBBER COMPOSITIONS OF POLYISOPRENE α-METHYLSTYRENE, DIVINYLBENZENE AND DIALKYL PEROXIDE

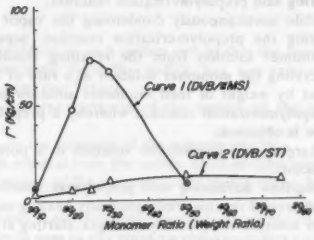
Ryota Fujio, Akigawa; Nobuyuki Kataoka, Tokyo; Yoshihide Fukabori, and Shiro Anzai, both of Higashi-Murayama, all of Japan, assignors to Bridgestone Fire Company Limited, Tokyo, Japan

Filed Apr. 15, 1974, Ser. No. 461,046

Claims priority, application Japan, Apr. 13, 1973, 48-41316; June 30, 1973, 48-73852

Int. Cl.² C08L 9/00

U.S. Cl. 260—880 R **8 Claims**



1. A one shot mouldable and curable homogeneous rubber composition having a high Young's modulus, consisting essentially of

100 parts by weight of a mixture of the following ingredients (a) and (b),

said ingredient (a) being polyisoprene rubber having at least 90% of cis-1,4bonds, and

said ingredient (b) being a monomer mixture composed of divinylbenzene and α-methylstyrene,

c. 0.5–2.5 parts by weight of a dialkyl peroxide to initiate polymerization of monomers of monomer mixture (b) and to cause cross-linking between the polymer formed from monomer mixture (b) and ingredient (a), and

d. 0.1–2.5 parts by weight of at least one compound selected from group consisting of aromatic secondary amines and alkyl substituted phenols to secure the heat resistance and stability of the cured rubber, the weight ratio of divinylbenzene/α-methylstyrene in said ingredient (b) being 80/20–65/35 and the weight ratio of said ingredient (a)/-said ingredient (b) being 65/35–50/50, and the rubber composition cured at 120°–180°C having a Young's modulus of 100–500 Kg/cm², a tear energy Γ of at least 20 Kg/cm and a tensile strength retention at 100°C of at least 60%.

3,981,944

METHOD FOR PRODUCING IMPACT RESISTANT THERMOPLASTIC RESIN BY CONTINUOUS BULK POLYMERIZATION

Takehiko Okamoto; Akihiko Kishimoto; Ikuo Nagai; Hiroshi Sato; Hotsuma Okasaka, and Masakazu Inoue, all of Nagoya, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 204,018, Dec. 2, 1971, abandoned. This application June 12, 1974, Ser. No. 478,535

Int. Cl.² C08L 9/02, 9/06

U.S. Cl. 260—880 R **9 Claims**

1. The method for the manufacture of high impact resistant thermoplastic resin by continuous bulk polymerization which comprises the steps of:

A. continuously charging a prepolymerization reactor with (1) a vinyl monomer solution of a vinyl composition which contains about 1–40 percent by weight of a diene type rubber polymer or a graft polymer obtained by extracting rubber polymer particles or vinyl monomer

grafter rubber polymer particles in latex with vinyl monomers wherein said vinyl monomers consist of

a. 60–90 percent by weight of styrene and 40–10 percent by weight of acrylonitrile or

b. 0–70 percent by weight of styrene, 50–98 percent by weight of methylmethacrylate and 0–35 percent by weight of acrylonitrile and (2) 5–20 percent by weight of water;

B. mixing said monomer solution so as to maintain a substantially uniform mixture;

C. prepolymerizing said monomer solution at about 95°–130°C until the concentration of the solid contents of the resulting reaction product is about 40–75 percent by weight, with generation of vapor of water and monomer during said prepolymerization reaction;

D. while simultaneously condensing the vapor volatilized during the prepolymerization reaction, separating the monomer solution from the resulting condensate and recycling the monomer solution at a rate of 20–60 percent by weight of feed monomer solution back to the prepolymerization reaction whereby a prepolymer solution is obtained;

E. charging said prepolymer solution in a polymerization reactor;

F. plug-flow advancing said prepolymer solution through said second reactor while gradually heating said prepolymer solution in a plurality of stages, starting at a temperature of about 100°–170°C up to about a temperature of 170°–270°C, polymerizing said prepolymer solution while vaporizing and recycling 5–20 percent by weight of the volatiles until the concentration of the solid components is at least about 90 percent by weight.

3,981,945

COATING COMPOSITIONS COMPRISING A POLYSULFONE AND A FLUOROCARBON POLYMER

Terence Edwin Attwood, Kimpton, and Barry William Farrant, St. Neots, both of England, assignors to Imperial Chemical Industries Limited, London, England

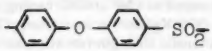
Filed Apr. 16, 1974, Ser. No. 461,408

Claims priority, application United Kingdom, Nov. 19, 1973, 53583/73

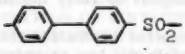
Int. Cl.² C08L 27/18

U.S. Cl. 260—900 **9 Claims**

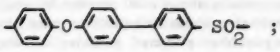
1. A coating composition which comprises a polymer mixture of (a) 10% to 90% by weight of at least one thermoplastic aromatic polysulphone having repeat units

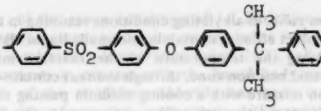
i) 

alone or in conjunction with repeat units selected from at least one of

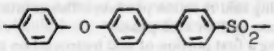
ii) 

and

 ;

iii)  ;

or repeat units (ii) or (iii) in conjunction with repeat units

iv) 

and, correspondingly, 90% to 10% by weight of at least one fluorocarbon polymer selected from polytetrafluoroethylene and copolymers of tetrafluoroethylene with up to 15% by weight of another unsaturated monomer, said composition being in the form of a dispersion of said fluorocarbon polymer dispersed in a solution of said thermoplastic aromatic polysulphone in a solvent therefor.

3,981,946

PERFORATED PLATE OF STEAM REFORMING VALVE

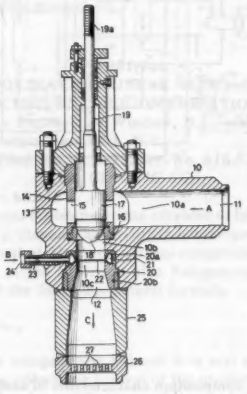
Masahiro Soya, Kawasaki, and Shokichi Kubota, Matsudo, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Feb. 5, 1975, Ser. No. 547,406

Claims priority, application Japan, Feb. 12, 1974, 49-16301; Feb. 12, 1974, 49-16302

Int. Cl.² B01F 3/04

U.S. Cl. 261—64 R **4 Claims**



1. In a steam reforming valve having pressure reducing valve means for reducing the pressure of superheated steam at high temperature and high pressure and temperature reducing means for reducing the temperature of the superheated steam by spraying water thereinto, a perforated plate comprising: a part fixed to a main structural part of said valve on the downstream side of said temperature reducing means with respect to the direction of flow of the steam within said main structural part; and a disc part held by said fixed part and having a plurality of through-holes for passing steam and sprayed water therethrough, said disc part having an outer periphery formed integrally with said fixed part and has at the inner part thereof a plurality of through-slits mutually communicating at the central part of the disc part and extending outward toward said outer periphery, and edge parts of the disc part defining said slits constituting free end parts relative to said fixed part, whereby thermal stresses in the disc part can be relieved.

3,981,947
METHOD FOR RECLAIMING WATERLOGGED PLASTIC INSULATED CONDUCTOR CABLE

Stanley Kaufman, Flanders, and Raffaele Antonio Sabia, Lincroft, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 208,420, Dec. 15, 1971, Pat. No. 3,733,426. This application Nov. 22, 1972, Ser. No. 308,659

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.[2] H01B *11/02, 3/30*

U.S. Cl. 264—36 **4 Claims**

1. A method of purging water present in the interstices of multipair sheathed plastic-insulated conductor telephone cable and for thereafter sealing said cable against further entry of water, comprising the steps of:

pumping into said cable a nongelling purgant characterized by complete miscibility in the water present; and thereafter

purging said nongelling purgant and included water therein by

pumping into said cable a gelling purgant characterized by complete miscibility with said first purgant

said gelling purgant characterized by an initial viscosity at the time of said pumping of less than 100 centipoises at any temperature between 35° and 90° Fahrenheit and a capability to gel in a predetermined period of the order of 24 hours after entering into said cable, and wherein said gelling purgant consists of an aromatic solvent oil containing greater than 90 weight percent aromatic molecules and equal amount by weight of a first and a second material, said first material consisting of from 25 to 150 grams of isocyanate prepolymer per liter of solution and said second material consisting of from 80 to 120 grams of hydroxyl-terminated polybutadiene per liter of solution and substantially 4 grams per liter of solution of dibutyl tin dilaurate.

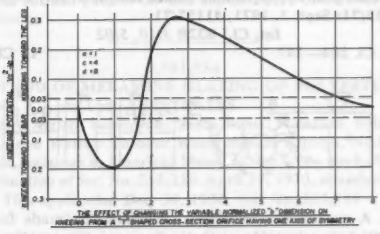
3,981,948
ARRANGEMENTS IN SPINNERETS OF SPINNING ORIFICES HAVING SIGNIFICANT KNEEING POTENTIAL

Bobby M. Phillips, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1975, Ser. No. 538,066

Int. Cl.[2] B28B *21/54*

U.S. Cl. 264—40.7 **10 Claims**



THE EFFECT OF CHANGING THE VARIABLE NORMALIZED "b" DIMENSION ON KNEEING FROM A "I" SHAPED CROSS-SECTION ORIFICE HAVING ONE AXIS OF SYMMETRY

1. A method for melt spinning, from inelastic materials, extruded lengths of predetermined cross-sections by arranging and spacing two or more spinning orifices with respect to each other so that the extruding material from each such arranged spinning orifices coalesces to form a single extruded length of predetermined cross-section, wherein the spinning orifices of each arrangement are each of non-round cross-section and has either one axis or no axis of symmetry in the plane of the spinneret and is so dimensioned that the coordinates of the centroid of the square of the velocity profile of the extruding material in the plane perpendicular to the axis of the orifice, as determined by

$$(V^2)_{centroid} = \frac{\int_A V^2 \vec{r}\, dA}{\int_A V^2\, dA}$$

and the coordinates of the centroid of the velocity profile of the extruding material in the plane perpendicular to the axis of the orifice, as determined by

$$(V)_{centroid} = \frac{\int_A V \vec{r}\, dA}{\int_A V\, dA}$$

are non-coincident at each orifice exit so that the flow of the extruding material from the orifice has non-axisymmetric emergence behavior, where

$(V^2)_{centroid}$ is the centroid of the square of the velocity profile;

$(V)_{centroid}$ is the centroid of the velocity profile;

$\int_A$ is the integral over the orifice cross-section area;

V^2 is the square of the velocity at any radius vector location r;

r is the radius vector from the origin of any set of orthogonal coordinate axes to any point r within the orifice cross-section; and

dA is the differential area element.

3,981,949
METHOD OF FORMING A CELLULAR ARTICLE HAVING AN INTEGRAL, COLOR-INTENSITY VARIED DECORATIVE PATTERN ON ITS SURFACE

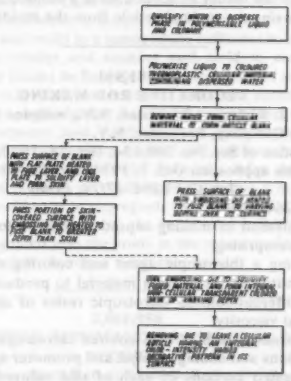
James Ernest Ryan, Knebworth, and Rodney Smale, Hatfield, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed July 2, 1973, Ser. No. 375,936

Claims priority, application United Kingdom, July 11, 1972, 32346/72

Int. Cl.[2] B29D *27/04*

U.S. Cl. 264—41 **5 Claims**



1. A method of forming a cellular polymeric article having an integral, color-intensity varied decorative pattern in its surface, comprising

forming a cellular polymeric blank by steps including emulsifying water as the disperse phase with a continuous phase comprising one or more polymerisable liquids and a colourant wherein the continuous phase is polymerisable to a transparent coloured thermoplastic material

when polymerised separately from the aqueous phase, casting and polymerising the continuous phase while maintaining the aqueous phase dispersed therethrough to form a water-filled cellular thermoplastic material, and removing the water from the cellular material to obtain said blank, and

pressing a surface of the blank with an embossing die heated sufficiently to fuse the cellular material and shaped so that the material becomes fused to varying depths over its surface, and thereafter cooling the embossing die so as to solidify the fused material and form a skin integral with the unfused cellular material, the various depth of fusion producing corresponding variations in the thickness of the transparent coloured skin thus formed, whereby the depth of colour varies according to the skin thickness and provides the integral, color-intensity varies decorative pattern.

3,981,950

METHOD FOR PRODUCTION OF CEMENT-BONDED MOLDED ARTICLES PARTICULARLY LIGHTWEIGHT FIBER BOARDS

Fridolin Pletzer; Hubert Strasser, both of Ferndorf, and Hans Tschernuth, Villach, all of Austria, assignors to Osterreichisch-Amerikanische Magnesit Aktiengesellschaft, Radenthein, Austria

Filed Dec. 11, 1973, Ser. No. 423,723

Claims priority, application Austria, Dec. 11, 1972, 10489/72

Int. Cl.² B29J *5/00*

U.S. Cl. 264—109 **8 Claims**

1. Method for the production of cement-bonded molded articles comprising the steps of:

a. feeding to a heated molding duct formed of endless belts a molding composition comprising a base material selected from the group consisting of wood fiber, wood chips, lignocelluloses, mineral fibers, glass fibers, plastic chips, expanded silicates, expanded glass and granules of foamed plastics and a binder consisting essentially of a portland cement which contains 1 to 30% by weight of a calcium-halogen aluminate of the composition $11CaO.7Al_2O_3.CaX_2$, wherein X is any halogen;

b. heating the molding composition in the molding duct to cause the binder to set and form a molded article, and

c. removing the molded article from the molding duct.

3,981,951

DECORATIVE ROD MAKING

Seymour I. Richman, Rochester, N.Y., assignor to Rochester Button Company, Rochester, N.Y.

Continuation of Ser. No. 300,134, Oct. 24, 1972, abandoned. This application Oct. 7, 1974, Ser. No. 512,845

Int. Cl.² B29C *17/14, 21/00*

U.S. Cl. 264—140 **6 Claims**

1. A method of making reproduceable button rods, said method comprising:

a. mixing a thixotropic agent and coloring material into quantities of liquid resin material to produce a plurality of different-colored thixotropic resins of approximately equal viscosity;

b. separating each of said colored thixotropic resins into portions and adding catalyst and promoter agents to said separated portions of each of said colored thixotropic resins;

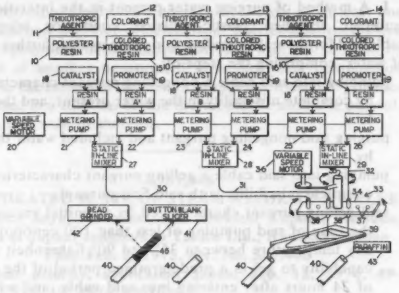
c. recombining said resin portions for each color and mixing said recombined resins to form accelerated resins each having an approximately equal and relatively low apparent viscosity from 2500 to 6000 centipoise to allow a relatively fast rate of flow;

d. feeding each of said accelerated thixotropic resins through nozzle means to drop each of said resins into an inclined trough promptly after said recombining;

e. moving said nozzle means repeatedly in a predetermined and substantially exactly reproducible motion to lay each of said resins in a predetermined and repeated pattern in said trough without entrapping air bubbles so said resins combine in a single stream without mixing said resins together;

f. metering the flow of each of said resins through said nozzle means at a substantially exactly reproduceable rate to form said predetermined resin pattern;

g. flowing said stream of said patterned resins a predetermined and reproduceable distance down a predetermined



and reproduceable incline of said trough to shape said repeated pattern;

h. flowing said shaped pattern into an inclined casting tube without entrapping air bubbles to form a reproduceable repeated pattern of said resins extending substantially uniformly throughout the length of said casting tube;

i. letting said resins rest in said inclined casting tube at a relatively high apparent viscosity increased by said thixotropic agent by at least 20% from said low apparent viscosity to maintain said reproduceable resin pattern; and

j. removing a cast rod of said resins from said tube before said resins are completely hardened.

3,981,952

FIBROUS MATERIALS

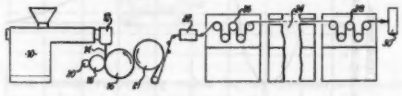
James Nelson Ruddell, Portadown, and Samuel McMeekin, Hillsborough, both of Northern Ireland, assignors to Lambeg Industrial Research Association, Lisburn, Northern Ireland

Filed July 24, 1972, Ser. No. 274,690

Claims priority, application United Kingdom, July 27, 1971, 35153/71; Sept. 3, 1971, 41157/71

Int. Cl.² B32B *3/10, 5/02*

U.S. Cl. 264—147 **17 Claims**



1. A process for treating a travelling film made from a molecularly-orientable synthetic thermoplastic organic polymer which includes the steps of pressing at least one side of the film, while it is in an unoriented condition and a molten deformable state, against a travelling surface in such a way that there is no relative movement between the surface of the film and travelling surface at the point of contact between the two, said travelling surface having, as an integral part thereof, a homogeneous series of high frequency discrete deformations so as to produce a homogeneous series of discrete deformations on said film, the frequency of the deformations being at least 100 per inch measured in every direction along the film surface, thereafter cooling said film to a non-molten state in which said deformations are substantially retained, whereby

the tendency of cracks which occur in the film after drawing to propagate is substantially reduced, and subsequently drawing said film.

3,981,953

METHOD FOR CASTING BLOCKS HAVING FRACTURED FACE

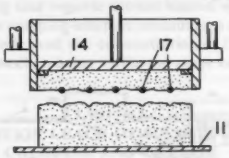
Donald John Haines, 12 Judges Close, Hereford, England

Filed Mar. 19, 1974, Ser. No. 452,661

Claims priority, application United Kingdom, July 4, 1973, 16801/73; July 20, 1973, 34698/73

Int. Cl.² B28B *3/02*

U.S. Cl. 264—163 4 Claims



1. A method of producing a plurality of cast blocks for building constructions, decorative panels and the like; each block having a substantially identical surface pattern on the face thereof to be exposed, the pattern taking the form of recessed lines impressed in said surface with the areas between said recessed lines having a random split appearance and contour, comprising successively filling a mold box having side walls and a bottom wall with a mass of semi-dry mix of the material from which the building element is to be formed, embedding the same frame in the material, the frame including a number of rigid interspaced elements, the center lines of which lie in a plane spaced from said bottom wall; compacting the mass of material with the elements of said frame embedded in the compacted mass so that a portion of the mass lies above said elements of the frame and a portion of the mass lies below said elements of the frame; then moving the frame and its elements relative to that compacted mass so as to randomly fracture the compacted mass in the space between said elements substantially along said plane, and removing the frame together with the portion of the compacted mass located above said elements of the frame to produce a pattern on each cast block wherein the fractured surface between said elements forms said areas having the random split appearance that is positioned between the impressed recessed lines forming said surface pattern on said exposed face of each of the cast blocks.

3,981,954

METHOD OF MELAMINE GLAZING OF POLYESTER SUBSTRATES

Salvatore Algieri, Somerville; Jonas Weiss, Plainfield, both of N.J., and Werner Theodor Raudenbusch, Rijsvijk, Netherlands, assignors to American Standard, Inc., New York, N.Y.

Continuation of Ser. No. 355,250, April 27, 1973, abandoned.

This application Dec. 30, 1974, Ser. No. 537,498

Int. Cl.² B29D *9/08*; B29G *1/00*

U.S. Cl. 264—240 1 Claim

1. A method of molding a composite article involving separately introducing reacting materials into the mold to produce a multi-layered article wherein one layer is self-sustaining prior to compositing, said method consisting essentially of:

a. preparing a polyester resin by reacting substantially equimolar parts of a phthalic acid and an alpha beta unsaturated polycarboxylic acid with a polyhydric alcohol in stochiometric amounts;

b. mixing approximately 2 parts each of a tri allyl and a di-allyl melamine with approximately 6 parts of the polyester resin of step (a) to form a moldable polyester allyl melamine composition;

c. molding the polyester-allyl melamine composition of step (b) into a substrate by subjecting the composition to a pressure at about 430 p.s.i., at a temperature of about 150°C, up to about 6 minutes;

d. applying an allyl melamine resin in solid form to the molded substrate while said substrate is still hot and then continuing to subject the hot molded substrate to the heat and pressure of step (c) for about 1½ minutes to form a cured laminating polyester product having a relatively thin allyl melamine resin glazed coat of about 25–45 microns, the glaze coat being cross-linked and bound to the allyl melamine contained in the substrate.

3,981,955

METHOD OF ROTATIONAL MOLDING REINFORCER-INCORPORATED PLASTICS

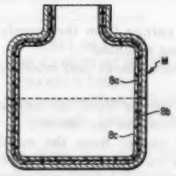
Yasuhiko Otani, and Setsuo Imada, both of Kobe, Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed Oct. 23, 1973, Ser. No. 408,528

Claims priority, application Japan, Oct. 21, 1972, 47-105570

Int. Cl.² B29C *5/04*

U.S. Cl. 264—255 8 Claims



1. A method for preparing reinforcer-incorporated articles by rotational molding, which comprises adding to a rotatable mold a reinforcer and a thermoplastic binder, said thermoplastic binder having an apparent density greater than that of the reinforcer, said thermoplastic binder being added in an amount smaller by weight than the amount of reinforcer but in an amount sufficient to support the reinforcer on the mold wall, heating said mold to a temperature sufficient to melt said thermoplastic binder and rotating said mold to cause said thermoplastic binder to flow along the inner wall of said mold and wherein said reinforcer is caused to at least partially float on said thermoplastic binder due to the said apparent density differential between said reinforcer and said thermoplastic binder and whereby the movement of said reinforcer and said thermoplastic binder causes the formation of a reinforcer layer having a plurality of voids therein, feeding a liquid matrix into the mold so as to impregnate the liquid matrix into the plurality of voids by rotating the mold, and solidifying the matrix impregnated into the voids in the rotary mold to form a hardened matrix, having a reinforcer layer.

3,981,956

CONTINUOUS AUTOMATED PLASTIC MOLDING METHOD

Wilbert Redmer, Boca Raton; Kenneth Rolin, Del Ray Beach, and Herman Nittel, Boca Raton, all of Fla., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 241,934, April 7, 1972. This application Dec. 13, 1974, Ser. No. 532,552

Int. Cl.² B29C *1/06*; B28B *5/04*

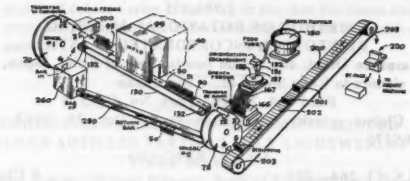
U.S. Cl. 264—275 2 Claims

1. A method of molding an article employing a molding machine having mold sections for receiving a mold core or insert, said method comprising:

providing a carrier having a mold core or insert supporting means thereon for presenting the mold core or insert to the mold in said molding machine;

providing a pair of opposed, rotatable, indexable, trunnion transfer wheels positioned on each side of said molding machine and a conveyor arranged for transfer of said carrier from one of the trunnion transfer wheels to the other, said transfer wheels having a plurality of carrier receiving positions thereon and receiving and transferring said carrier to various positions around the periphery thereof;

inserting the carrier in one of said trunnion transfer wheels;



indexing said transfer wheel to the conveyor;

transferring the carrier from said transfer wheel to said conveyor;

conveying the carrier from the transfer wheel to the mold in the molding machine;

molding an article about said mold core or insert on said carrier;

removing said carrier from the molding machine with the article remaining on the carrier;

conveying the carrier from the molding machine to the other of said trunnion transfer wheels;

inserting said carrier on said other transfer wheel;

indexing said other transfer wheel away from the conveyor; and

removing the molded article from the carrier.

3,981,957

PROCESS FOR PREPARING FINELY DIVIDED POLYMERS

Robert A. van Brederode, Baytown, Tex., and Robert A. Steinkamp, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 6, 1975, Ser. No. 602,213

Int. Cl.² C08F *6/00*

U.S. Cl. 260—878 R **17 Claims**

1. A process for producing high density polymer powder comprising:

heating a normally solid thermoplastic polymer to form a melt,

intimately mixing into said melt from 10 to 50 weight percent of a solvent, and

discharging said mixture through an atomizing nozzle.

3,981,958

GRAFT COPOLYMERS AND PROCESS FOR PRODUCING SAME

Kunihiko Nakashima, Gifu; Ryoichi Muroi, Nagoya; Mitsuo Imai, Gifu, and Kenji Sato, Tajimi, all of Japan, assignors to Toyoda Gosei Kabushiki-Kaisha (Toyoda Synthetics Co., Ltd.), Japan

Filed Apr. 18, 1974, Ser. No. 462,182

Claims priority, application Japan, Apr. 19, 1973, 48-43669; Apr. 19, 1973, 48-51170; Apr. 19, 1973, 48-133612

Int. Cl.² C08F *255/06*

U.S. Cl. 260—878 R **12 Claims**

1. A generally transparent, rubbery elastomeric graft copolymer consisting essentially of an ethylene/propylene/non-conjugated diene terpolymer backbone and a graft polymerized moiety consisting essentially of lower alkyl methacrylate in a weight ratio of 0.1–20, said graft copolymer being free of ungrafted polymer.

3,981,959

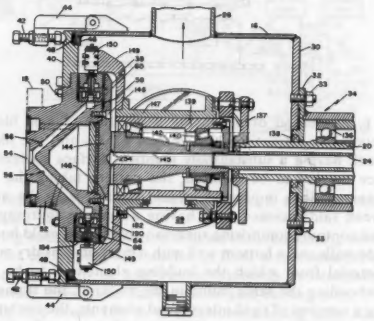
PELLETIZING METHOD

David William Cuff, Chepachet, R.I., assignor to Leesona Corporation, Warwick, R.I.

Continuation of Ser. No. 414,699, Nov. 12, 1973, abandoned, which is a division of Ser. No. 287,276, Sept. 8, 1972, Pat. No. 3,792,950. This application Feb. 12, 1975, Ser. No. 549,375

Int. Cl.² B28B *11/16*

U.S. Cl. 264—142 **9 Claims**



1. A method of extruding thermoplastic material comprising the steps of, heating the thermoplastic material to make it fluid, conveying the heated material to an extrusion die having at least one extrusion orifice in the form of a finite length passage of significant extent, forcing the material through the orifice and outward from said die, directing a liquid coolant under pressure into contact with the outer surface of said material passing through said orifice, and vaporising part of said coolant immediately upon entrance of the coolant to said orifice while simultaneously contacting the material with said coolant to form at least a solidified wall surrounding an inner core of the material while simultaneously lubricating the wall of said orifice by said non-vaporized coolant to facilitate passage of the material therethrough.

3,981,960

REPROCESSING METHOD OF CARAMIC NUCLEAR FUELS IN LOW-MELTING NITRATE MOLTEN SALTS

Giovanni Brambilla, Stagno; Giacomo Caporali, and Mario Zambianchi, both of Pisa, all of Italy, assignors to AGIP Nucleare S.p.A., Rome, Italy

Filed Apr. 24, 1973, Ser. No. 353,955

Claims priority, application Italy, Apr. 27, 1972, 23583/72; Apr. 27, 1972, 23584/72

Int. Cl.² C01G *56/00*

U.S. Cl. 423—5 **11 Claims**

1. The method of reprocessing ceramic nuclear fuel, wherein said fuel is mixed with a molten, eutectic mixture of at least two alkali metal nitrates, heated to a temperature in the range between 200°C and 300°C, and then subjecting said molten nuclear fuel-containing mixture to the action of a gaseous stream containing nitric acid vapours.

3,981,961

METHOD OF SELECTIVE STRIPPING OF PLUTONIUM FROM ORGANIC SOLVENTS LOADED WITH PLUTONIUM

Andre Bathellier, Sceaux, and Michel Germain, Marcoussis, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 21, 1973, Ser. No. 427,349

Claims priority, application France, Dec. 28, 1972, 72.46655

Int. Cl.² B01D *11/00*

U.S. Cl. 423—9 **8 Claims**

1. A method of selective stripping of plutonium from an organic solvent loaded with plutonium comprises countercurrently contacting said organic solvent loaded with plutonium with an aqueous stripping solution containing a salt of hydroxylamine and formic acid, the concentration of the formic acid in the reaction medium being within the range of 1M to 5M.

3,981,962

DECOMPOSITION LEACH OF SULFIDE ORES WITH CHLORINE AND OXYGEN

Gary A. Smyres, Sparks; Philip R. Haskett, Reno; Bernard J. Scheiner, Sparks, and Roald E. Lindstrom, Reno, all of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed June 30, 1975, Ser. No. 591,743

Int. Cl.² C01G *3/04, 9/04, 51/08, 11/00*

U.S. Cl. 423—35 **7 Claims**

1. A process for decomposing complex sulfide ores or concentrates comprising treating an aqueous slurry of the ore or concentrate by addition of a combination of gaseous chlorine and gaseous oxygen, the chlorine being added at a rate sufficient to provide a temperature of 90° to 160°C and in an amount only sufficient to convert sulfides of metals from the group consisting of zinc, copper, silver, nickel, cobalt and cadmium to chlorides, and the oxygen being added at a rate sufficient to maintain the temperature of 90° to 160°C and in an amount sufficient to ensure complete decomposition of the ore or concentrte and provide an oxygen partial pressure of 5 to 160 psig, whereby the metals from the group consisting of zinc, copper, silver, nickel, cobalt and cadmium are solubilized, metals from the group consisting of iron, antimony and arsenic are hydrolyzed to insoluble hydrous oxides, lead is converted to insoluble lead sulfate or chloride, and sulfur in the form of sulfide is converted largely to elemental sulfur.

3,981,963

IRON CHLORIDE ACTIVATED OXIDATION OF SULFIDE ORES

Kenneth Leslie Agnew, 100 Tilley Road, Sault Ste. Marie, Canada (P6B 3Y9)

Filed Jan. 22, 1975, Ser. No. 542,917

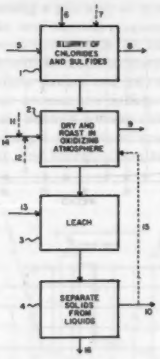
Int. Cl.² C01G *3/04, 9/04, 51/08, 53/08*

U.S. Cl. 423—39 **11 Claims**

7. A process for low-temperature roasting of finely-ground sulfides of the metallic group consisting of nickel, copper, cobalt, zinc and iron, containing at least seven percent sulfur, to produce water-insoluble iron oxide and water soluble non-ferrous salts, comprising adding iron chloride to the sulfides in an amount equal to at least ten percent of the amount of the metal sulfides to be oxidized, heating the mixed chlorides and sulfides at temperatures between 220° C and 450° C while passing an oxygen-containing gas through said mixture, and adding enough H_2O to ensure that said oxygen-containing gas includes at least enough water vapor to substantially satisfy the equation:

$$2\ FeCl_3 + 2\ H_2O + 2\ O_2 = 2\ Fe_2O_3 + 4\ HCl,$$

where the $FeCl_3$ is that in excess of the amount necessary to provide chloride ion to the non-ferrous metal chlorides formed, and where a ratio of between three mols of HCl to each mol of water vapor, and 0.1 mol of HCl to each mol of water vapor, is maintained in the atmosphere surrounding the calcine while it is cooled below 400° C, and leaching the



water-soluble non-ferrous metal from the water-insoluble iron oxide with water so slightly acid as to be substantially without solvent action on ferric oxide.

3,981,964

SODIUM SULPHATE COMPOSITIONS AND THEIR PRODUCTION

Danvers A. Swales, Stockton-on-Tees, England, assignor to British Chrome & Chemicals Limited, Stockton-on-Tees, England

Filed Dec. 3, 1974, Ser. No. 529,177

Claims priority, application United Kingdom, Dec. 7, 1973, 56844/73

Int. Cl.² C01G *37/14;* **C01D** *5/00*

U.S. Cl. 423—53 **13 Claims**

1. A process of making a particulate composition of sodium sulphate containing chromium compound impurity and having stable, freeflowing, properties from chrome saltcake feed material containing sodium sulphate and sodium dichromate impurity, the process comprising subjecting the sodium dichromate to reduction in the presence of moisture to form a chrome saltcake product that is less susceptible to absorption of moisture than the chrome saltcake feed material, and the resulting composition is dried to freeflowing form.

8. A process of making a particulate composition of sodium sulphate containing chromium compound impurity and having stable, freeflowing, properties from chrome saltcake feed material containing sodium sulphate and sodium dichromate impurity, the process comprising subjecting the sodium dichromate in the said cake to double decomposition by reaction in the presence of moisture with a mineral acid salt having a cation other than sodium to form a chrome saltcake product that is less susceptible to absorption of moisture that the chrome saltcake feed material, and the resulting composition is dried to freeflowing form.

3,981,965

SUPPRESSION OF WATER POLLUTION CAUSED BY SOLID WASTES CONTAINING CHROMIUM COMPOUNDS

Alan B. Gancy, Syracuse, and Christian A. Wamser, Camillus, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

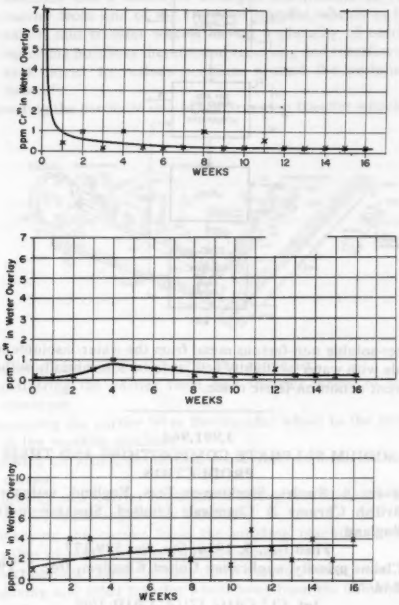
Continuation of Ser. No. 281,588, Aug. 17, 1972, abandoned. This application June 17, 1975, Ser. No. 587,780

Int. Cl.² C01G *37/02, 37/00;* **C01B** *17/02*

U.S. Cl. 423—55 **14 Claims**

1. A method fpr continuously insolubilizing essentially all water-solubilized hexavalent chromium compounds leached

from a chrome ore residue obtained by production of chromium chemicals for chromite ore by roasting the ore under alkaline oxidizing conditions to form water-soluble hexavalent chromium compounds, which comprises adding to said resi-



due a sulfur-containing reductant, thereby continuously effecting reduction of said water-solubilized hexavalent chromium compounds in the presence of an aqueous medium under conditions sufficient to reduce said water-solubilized hexavalent chromium compounds to their insoluble form.

3,981,966

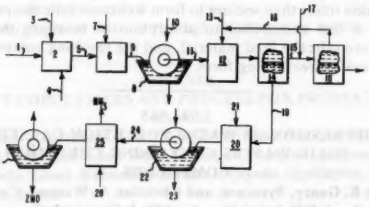
ZINC RECOVERY FROM ACIDIC AQUEOUS STREAMS

Everett Ira Baucom, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 26, 1974, Ser. No. 492,230

Int. Cl.² C01G *9/02*

U.S. Cl. 423—104 **9 Claims**



9. A process for the separation of zinc ion from metal ions including copper and iron contained in an acidic aqueous sulfate solution and recovery of zinc as hydrated zinc oxide which comprises the sequential steps of

a. adding sufficient calcium oxide to said solution to adjust the pH thereof to about 3.5 and maintaining said solution at a temperature of at least 60°C. for a period of at least 30 minutes while passing an oxygen containing gas therethrough,

b. adding of sufficient ammonium hydroxide to the product of step (a) to form and maintain in solution the tetrammine sulfate complexes of substantially all of the zinc and copper ions present,

c. separating the liquid and solids from step (b),

d. contacting one part by volume of the liquid from step (c) with less than one part of a substantially water-insoluble liquid hydrocarbon containing at least 0.10 moles per liter of a hydroxy oxime whereby the cupric ion is extracted from the aqueous liquid and separating the resultant aqueous and organic phases,

e. contacting the aqueous phase from step (d) with amounts of a slurry comprising sufficient ammoniacal calcium oxide and hydroxide to neutralize substantially all acid present and to convert the zinc tetrammine sulfate to zinc tetrammine hydroxide and to remove the sulfate ion by precipitation of calcium sulfate dihydrate,

f. separating the liquid and solids from step (e),

g. contacting the liquid from step (f) with a gas comprising water vapor whereby ammonia is liberated by the decomposition of the zinc tetrammine complex to hydrated zinc oxide which precipitates,

h. recovering zinc oxide from the product of step (g) by drying and thereafter heating the precipitate.

3,981,967

PROCESS FOR THE RECOVERY OF BOUND MERCURY FROM MERCURY-CONTAINING CATALYSTS

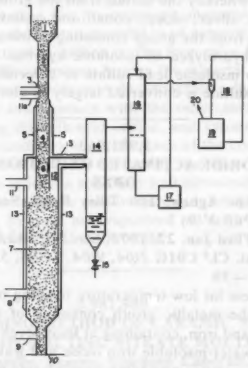
Heinz Maiwald; Gunter Hockele, and Hermann Sauer, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Nov. 3, 1971, Ser. No. 195,378

Claims priority, application Germany, Nov. 4, 1970, 2054102

Int. Cl.² C01G *13/04*

U.S. Cl. 423—107 **8 Claims**



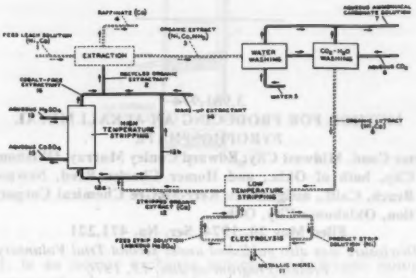
1. In a process for the recovery of mercury (II) chloride from a spent activated carbon catalyst containing $HgCl_2$ and organic impurities comprising heating said catalyst to 270°–600°C while passing a carrier gas therethrough, withdrawing from said heated catalyst resultant gaseous mixture of carrier gas and desorbed mercury compounds; and introducing chlorine through a first inlet into the resultant withdrawn gaseous mixture containing HgCl to convert the HgCl to $HgCl_2$, the improvement which comprises a pretreatment step of contacting the spent catalyst with chlorine at a temperature of 100°–300°C prior to said heating of the catalyst to 270°–600°C while passing said carrier gas therethrough, the

latter-mentioned chlorine being introduced through a second inlet separate and distinct from said first inlet, thereby avoiding depositions of carbon black and organic solid products and the formation and precipitation of metallic mercury and HgCl from the discharged carrier gas.

3,981,968
SOLVENT EXTRACTION OF NICKEL FROM AMMONIACAL SOLUTIONS

David J. Miller, Gretna, and Tadeusz K. Wiewiorowski, New Orleans, both of La., assignors to Freeport Minerals Company, New York, N.Y.

Continuation-in-part of Ser. No. 407,925, Oct. 19, 1973, abandoned. This application July 11, 1974, Ser. No. 487,560
Int. Cl.² C01G *51/10, 53/00*
U.S. Cl. 423—139 **22 Claims**



1. In a method for selectively recovering nickel from an aqueous ammoniacal solution containing nickel and cobalt wherein the solution is treated with an extractant comprising a substantially water immiscible organic liquid and an oxime or oxine compound capable of selectively extracting nickel into the extractant, to thereby extract substantially all the nickel into the extractant and a minor amount of the cobalt and ammonia present in the ammoniacal solution, and wherein the nickel is recovered from the extractant by stripping it at substantially ambient temperatures with an aqueous solution capable of withdrawing the nickel from the extractant into the aqueous solution:

the improvement for removing the cobalt from the extractant which comprises stripping at least a portion of the extractant with aqueous sulfuric acid at temperatures of about 170° to 300°F., after the extractant has been stripped with aqueous solution at substantially ambient temperatures to remove nickel from the extractant, to thereby remove from the extractant sufficient cobalt to permit recycle of the extractant to the extraction step of the process.

3,981,969
PRESSURIZED COLUMN SOLVENT EXTRACTION OF NICKEL FROM AMMONIACAL SOLUTIONS

Kenneth D. Uitti, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

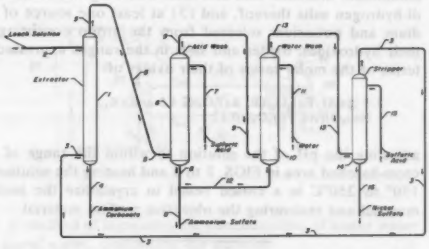
Filed Oct. 15, 1975, Ser. No. 622,584
Int. Cl.² C01G *53/10*
U.S. Cl. 423—139 **10 Claims**

1. A process for the recovery of nickel from an ammoniacal solution which comprises the steps of:

a. introducing a nickel-containing ammoniacal solution into a solvent extraction first column containing a plurality of spaced-apart perforated trays, or decks, and therein countercurrently contacting said ammoniacal solution, at a superatmospheric pressure in the range of about 100 to about 1,000 psig., with an organic solvent comprising an oxime and at least one hydrocarbon having from about three to about fifteen carbon atoms per molecule, and recovering a first solvent-rich, nickel-containing stream of reduced ammonia concentration;

b. introducing said first solvent-rich stream into a second column containing a plurality of spaced-apart perforated trays, or decks, and therein countercurrently contacting said first solvent-rich stream, at substantially the same pressure, with sulfuric acid, to provide (i) a solvent-lean ammonium sulfate stream and, (ii) a second solvent-rich, nickel- and free ammonium sulfate-containing stream;

c. introducing said second solvent-rich stream into a third column containing a plurality of spaced-apart perforated trays, or decks, and therein countercurrently contacting



said second solvent-rich stream, at substantially the same pressure, with water to provide (i) an aqueous ammonium sulfate stream and, (ii) a third solvent-rich, nickel-containing stream substantially free from ammonium sulfate;

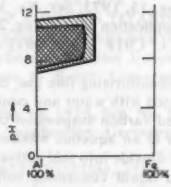
d. introducing said third solvent-rich stream into a fourth column containing a plurality of spaced-apart perforated trays, or decks, and therein countercurrently contacting said third solvent-rich stream, at substantially the same pressure, with sulfuric acid to provide (i) a fourth solvent-rich stream, substantially free from nickel, and, (ii) a concentrated nickel sulfate stream; and,

e. recovering said concentrated nickel sulfate stream from said fourth column.

3,981,970
METHOD FOR THE PRODUCTION OF A ZEOLITE MATERIAL

Takeo Wada, and Kazuo Okada, both of Suita, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 808,493, March 19, 1969, Pat. No. 3,622,268. This application July 16, 1971, Ser. No. 163,317
Claims priority, application Japan, Mar. 20, 1968, 43-18136; Apr. 10, 1968, 43-23846; July 25, 1968, 43-52704
Int. Cl.² C01B *25/00, 27/00*
U.S. Cl. 423—306 **6 Claims**



1. A method for the production of a zeolitic material represented by the formula:

$$R_xH_{5-x}(Al_yFe_{1-y})_4(P_lAs_{1-l})_{12}O_{36}\cdot zH_2O$$

wherein R represents Na or K, x, y, z and l are numerical values of $0 \leqq x \leqq 5$, $0 \leqq y \leqq 1$, $z \leqq 9$ and $0 \leqq l \leqq 1$, respec-

tively; which comprises preparing an aqueous solution by dissolving in water (1) at least one source of aluminum and iron selected from the group consisting of their chlorides, sulfides, nitrates, phosphates, arsenates, sulfates, acetates, oxides, hydroxides, gels soluble in alkalis or acids and alum containing either iron or aluminum, (2) at least one source of phosphorus and arsenic selected from the group consisting of phosphorus pentoxide, phosphoric acid, and condensed acids which give phosphoric acid when dissolved in water, sodium phosphate, potassium phosphate, ammonium phosphate, said phosphates including the mono- and di-hydrogen salts thereof, water-soluble calcium phosphate, strontium phosphate, aluminum phosphate, iron phosphate, arsenic pentoxide, arsenic acid, arsenous acid, sodium arsenate, potassium arsenate, ammonium arsenate, said arsenates including the mono- and di-hydrogen salts thereof, and (3) at least one source of sodium and potassium selected from the group consisting of their hydroxides, oxides and salts in the ranges expressed in terms of the molar ratios of their oxides of

$$3.5 \leqq (Al, Fe)_2O_3/(P, As)_2O_5 \leqq 4.5 \text{ and } (K, Na)_2O/(Al, Fe)_2O_3 > 0.12$$

adjusting the pH of the solution to within the range of the cross-hatched area in FIGS. 1 to 4 and heating the solution at 150° to 250°C in a closed vessel to crystallize the zeolitic material and recovering the objective zeolitic material.

3,981,971

PROCESS FOR REDUCING NITROGEN OXIDES

Masumi Saito, Kobe; Sumio Tani, Neyagawa; Tateo Ito, Kyoto, and Shigeaki Kasaoka, Okayama, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Japan

Filed Sept. 4, 1974, Ser. No. 503,164

Claims priority, application Japan, Sept. 13, 1973, 48-103545

Int. Cl.² B01J 8/00; C01B 17/00

U.S. Cl. 423—239 4 Claims

1. A process for reducing nitrogen oxide contained in stack offgases to nitrogen and water which comprises reducing the nitrogen oxide by contacting stack offgases containing nitrogen oxide, oxygen, and sulfur dioxide with ammonia in the presence of a catalyst consisting essentially of a heavy metal sulfide selected from the group consisting of copper sulfide, iron sulfide, and mixtures thereof at a temperature in the range of about 250° to 550°C, the ammonia being present in an amount of from about 0.67 to 4 times the stoichiometric amount of the nitrogen oxide.

3,981,972

METHOD FOR DESULFURIZING FLUE GAS BY ACTIVE CARBON SUSPENSION

Yukio Hishinuma, and Zensuke Tamura, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 15, 1973, Ser. No. 388,462

Claims priority, application Japan, Aug. 25, 1972, 47-84519

Int. Cl.² C01B 17/00; B01J 8/00

U.S. Cl. 423—244 24 Claims

1. A method for desulfurizing flue gas, comprising contacting a flue gas saturated with water and containing sulfur dioxide with an activated carbon suspension containing particles of activated carbon in an aqueous-washing solution thereby absorbing the sulfur dioxide into said activated carbon suspension and forming a liquid containing sulfate ions at a low concentration in said activated carbon suspension, separating a portion of said liquid from said activated carbon suspension, and contacting said portion of liquid with fresh flue gas before said fresh flue gas contacts said activated carbon suspension thereby concentrating said portion of liquid containing sulfate ions at a low concentration and saturating said fresh flue gas with water before said fresh flue gas contacts said activated carbon suspension.

3,981,973

CRYSTAL GROWTH IN THE PRESENCE OF FINELY DIVIDED POLYTETRAFLUOROETHYLENE

John G. Richardson, Cleveland, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Filed Dec. 17, 1973, Ser. No. 425,320

Int. Cl.² C01D 13/00, 5/00; C01G 1/00

U.S. Cl. 423—265 3 Claims

1. A crystal of an inorganic ionic metal salt crystallizable from an aqueous solution of said salt, said crystal consisting essentially of said inorganic ionic metal salt and at least one particle of water-wettable polytetrafluoroethylene polymer in a size range from about 0.05 μ to about 0.5 μ, formed in an aqueous suspensoid, said particle being occluded in said crystal which is formed in a size range from about 80 U.S. Standard mesh to about ¼ inch mesh.

3,981,974

METHOD FOR PRODUCING AN ALKALI METAL PYROPHOSPHATE

Peter Coad, Midwest City; Edward Conley Murray, Oklahoma City, both of Okla., and Homer Charles Reed, Newport Beach, Calif., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed May 20, 1974, Ser. No. 471,221

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C01B 15/16, 25/26

U.S. Cl. 423—315 12 Claims

1. A method for producing an alkali metal pyrophosphate comprising: admixing an alkali metal nitrate with aqueous phosphoric acid, heating said admixture to a temperature of at least about 700°C in the presence of a catalytic amount of at least one metal oxide selected from the group consisting of oxides of iron, vanadium, manganese and chromium for a period of time sufficient to produce said alkali metal pyrophosphate and gaseous reaction products and recovering said alkali metal pyrophosphate.

3,981,975

PREPARATION OF ANHYDROUS NITRIC ACID

Clifford L. Coon, Menlo Park, Calif., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 369,309, June 12, 1973, abandoned.

This application Feb. 12, 1975, Ser. No. 549,198

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C01B 21/46; C07C 79/12

U.S. Cl. 423—390 9 Claims

1. A method for preparing a solution of anhydrous nitric acid in methylene chloride comprising extracting an aqueous mixture of nitric acid and sulfuric acid with methylene chloride.

4. A method for preparing anhydrous nitric acid comprising:

a. preparing an aqueous solution of nitric acid and sulfuric acid;

b. extracting the aqueous acid mixture with methylene chloride;

c. separating the anhydrous nitric acid from the methylene chloride raffinate.

3,981,976

PROCESS FOR HYDROGEN ISOTOPE CONCENTRATION BETWEEN LIQUID WATER AND HYDROGEN GAS

William H. Stevens, Deep River, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

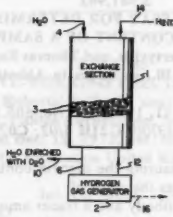
Continuation-in-part of Ser. No. 104,291, Jan. 6, 1971, abandoned. This application July 13, 1973, Ser. No. 379,177

Claims priority, application Canada, Jan. 28, 1970, 73320

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² B01D *5/02*

U.S. Cl. 423—580 13 Claims



1. In an isotope exchange process for hydrogen isotope concentration between liquid water and hydrogen gas, comprising:

a. contacting at a temperature in the range 15°C to 70°C, in an exchange section, liquid feed water and hydrogen gas from a reaction vessel, with one another and with a catalyst consisting of at least one catalytically active metal selected from Group VIII of the Periodic Table so that the deuterium isotope of hydrogen is transferred to and concentrated in the liquid water passing through and leaving the exchange section in either counter-current or cocurrent flow,

b. passing the liquid water thus enriched with the deuterium isotope of hydrogen concentrated therein to the reaction vessel wherein the hydrogen gas for the exchange section is generated from a portion of the enriched water and then passed through the exchange section, and

c. removing a portion of the water enriched in the exchange section, the improvement comprising:

d. the catalyst is provided in the exchange section as at least one catalyst assembly comprising the catalyst and a substantially liquid-water-repellent organic polymer or resin coating thereon selected from the group consisting of polyfluorocarbons, hydrophobic hydrocarbon polymers of medium to high molecular weight and silicones, and which is permeable to water vapour and hydrogen gas, whereby:

e. the or each catalyst assembly causes hydrogen isotope exchange and concentration in the exchange section as follows:

$$HD\ gas + H_2O\ vapour \overset{catalyst}{\rightleftharpoons} H_2\ gas + HDO\ vapour,$$

and

$$HDO\ vapour + H_2O\ liquid \overset{liquid\ water\ surface}{\rightleftharpoons} HDO\ liquid + H_2O\ vapour$$

so that direct contact between the catalyst metal and liquid water and wetting of the catalyst is retarded by the coating thereby retarding poisoning of the catalyst by the liquid water.

3,981,977

METHOD OF PRODUCING DEUTERIUM-OXIDE-ENRICHED WATER

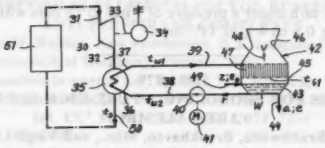
Heinrich Mandel, Essen, Germany, assignor to Rheinisch-Westfalisches-Elektrizitatswert Aktiengesellschaft, Essen, Germany

Continuation-in-part of Ser. No. 223,038, Feb. 2, 1972, abandoned, which is a continuation of Ser. No. 865,384, Oct. 10, 1969, abandoned. This application Aug. 3, 1972, Ser. No. 277,662

Claims priority, application Germany, Oct. 12, 1968, 1802867

Int. Cl.² C01B *5/02*

U.S. Cl. 423—580 3 Claims



1. A method of increasing the concentration of heavy water in natural water, comprising the steps of:

circulating a flow of natural water through a cascade of treatment stages, each treatment stage comprising a steam turbine, a cooling circuit, a condenser, and an open-air cooling tower;

alternately elevating the temperature of said natural water in each treatment stage by indirect heat exchange with the exhaust steam of said turbine in said condenser and lowering the water temperature by exposure thereof to approximately ambient temperature in said open-air cooling tower whereby a fraction of the water evaporates in each treatment stage;

continuously transferring a portion of the cooled water from one cooling circuit to another in a predetermined cascade, at a rate exceeding the evaporation losses of all succeeding cooling circuits of the cascade, with progressive enrichment of the circulating water in its heavy-water content from one cooling circuit to the next;

continuously supplying fresh water to the first cooling circuit of the cascade at a rate balancing the evaporation thereof and the portion transferred therefrom to the next-following cooling circuit; and

continuously withdrawing part of the cooled water of the last cooling circuit in the cascade with an increased concentration of heavy water, the withdrawn part representing an excess of the supplied water over the combined evaporation losses of all cooling circuits.

3,981,978

WORKING UP AQUEOUS TITANIUM DIOXIDE HYDRATE SUSPENSIONS

Raoul Weiler, Berchem, and Henri Uwents, Ekeren, both of Belgium, assignors to Bayer Antwerpen N.V., Antwerp, Belgium

Filed May 14, 1975, Ser. No. 577,492

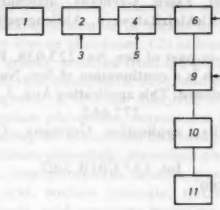
Claims priority, application Germany, May 17, 1974, 2423983

Int. Cl.² C01G *23/04*, *23/06*, *23/08*

U.S. Cl. 423—610 3 Claims

1. In the recovery of titanium dioxide by subjecting an aqueous titanium dioxide hydrate suspension to at least one stage of filtering to form a filter cake, adjusting the composition and calcining the adjusted filter cake, the improvement which comprises pressure filtering the aqueous titanium dioxide hydrate suspension in a membrane filter under a pressure of 3 bars to 16 bars to form a homogeneous substantially

crack-free filter cake of a thickness of about 10 to 25 mm, and pressure washing the filter cake with liquid flowing at a rate



of 0.1 to 1 m/h under a pressure of 1 bar to 16 bars with water containing 0.8 to 4 g of Ti^{3+}/liter.

3,981,979

PROCESS FOR PRODUCING A PURE HIGH SURFACE AREA ALUMINA

David G. Braithwaite, Brookhaven, Miss., and Virgil L. Seale, Houston, Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 400,491, Sept. 24, 1973, abandoned, which is a continuation-in-part of Ser. No. 201,384, Nov. 23, 1971, abandoned. This application June 6, 1975, Ser. No. 584,783

Int. Cl.² C01F 7/02

U.S. Cl. 423—628 2 Claims

1. A process for producing a pure, high surface area alumina which comprises reacting in an aqueous media an acidic aluminum salt from the group consisting of aluminum chloride and aluminum sulfate, with a lower aliphatic epoxide from the group consisting of ethylene oxide, 1,2-propylene oxide and epichlorohydrin, to form an alumina gel, washing said gel with an aqueous solution of ammonia which has a pH of at least 7, said gel being characterized as porous and filterable, separating said aqueous solution of ammonia from said gel, and then recovering the purified alumina as a product of the process.

3,981,980

RADIOPHARMACEUTICALS FOR CHOLESCINTIGRAPHY

Richmond J. Baker, West Beach, and Johan C. Bellen, Grange, both of Australia, assignors to The Council of the Institute of Medical and Veterinary Science and The University of Adelaide (Anti-Cancer Foundation), both of Adelaide, Australia

Filed Aug. 8, 1974, Ser. No. 495,875

Claims priority, application Australia, Aug. 24, 1973, 4625/73

Int. Cl.² A61K 43/00, 29/00; G01T 1/161; G21H 5/02

U.S. Cl. 424—1 9 Claims

1. A radiopharmaceutical for cholescintigraphy formed by the reaction of pyridoxal and amino acids labelled with a radionuclide.

3,981,981

METHOD OF RADIOIMMUNOASSAY EMPLOYING DIFFUSION

Matti Antero Reunanen, Kupittaankatu 11-13 C 38, 20520 Turku 52, Finland

Filed Jan. 18, 1974, Ser. No. 434,733

Claims priority, application Finland, Jan. 25, 1973, 202/73

Int. Cl.² G01N 33/00; G21H 5/02

U.S. Cl. 424—1.5 5 Claims

1. A method of radioimmunoassay comprising the steps of:

a. bringing the large-molecule antibody of the small-molecule antigen to be determined into a slit-shaped chamber between dialysis membranes in a reaction vessel,

b. bringing the antigen to be determined into said vessel, into which a specified quantity of the radioactive form of this antigen has been added,

c. incubating, whereby the antigen and its radioactive form freely penetrate through the membranes and react with the antibody,

d. washing, whereby water and the unreacted antigen freely pass through the membranes, and

e. measuring the radioactivity of the washed complex remaining between the membranes, and

f. determining the antigen quantitatively.

3,981,982

RADIOIMMUNOASSAY FOR DETERMINING THE DIGOXIN CONTENT OF A SAMPLE

Raymond Oslapas, Libertyville, and Thomas Raymond Herrin, Waukegan, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Sept. 11, 1974, Ser. No. 505,185

Int. Cl.² G01N 33/00; G21H 5/02; C07J 19/00

U.S. Cl. 424—1.5 7 Claims

1. A method of measuring the digoxin content of a serum sample which comprises the steps of:

a. adding digoxin antibody and a tracer amount of radioactively labeled 3-0-(4-Hydroxyphenethylcarbamoyl) digoxigenin reagent to said serum sample to form a mixture;

b. incubating said mixture to permit the digoxin in the sample and said radioactively labeled reagent to bind to the digoxin antibody;

c. adding a precipitating agent to the mixture to facilitate the formation of a precipitate and thereby separate the bound labeled digoxin from the free digoxin;

d. separating the supernatant liquid from the precipitate which is formed; and

e. measuring the radioactivity remaining in the precipitate.

6. A compound selected from the group consisting of 3-Chloroformyldigoxigenin and 3-0-(4-Hydroxyphenethylcarbamoyl) digoxigenin.

3,981,983

RAPID, RADIOCHEMICAL-LIGAND BINDING ASSAY FOR METHOTREXATE

J. Douglas Caston, Cleveland Heights, Ohio, and Barton A. Kamen, Rockville Centre, N.Y., assignors to Case Western Reserve University, Cleveland, Ohio

Filed June 30, 1975, Ser. No. 591,310

Int. Cl.² G01N 33/00; G21H 5/02; A61K 43/00

U.S. Cl. 424—1.5 12 Claims

1. A method for determining the concentration of methotrexate in biological material comprising the steps of:

a radioisotopically relating the bound amounts of labeled methotrexate and known concentrations of methotrexate in a first system containing a predetermined amount of labeled methotrexate, a binder factor for methotrexate, a binder cofactor, and a predetermined amount of unlabeled methotrexate;

b radioisotopically determining the bound amount of said labeled methotrexate in a second system containing said predetermined amount of labeled methotrexate, said binder and said binder cofactor, and a test sample or said biological material to be determined; and

c correlating the bound amount of labeled methotrexate determined in step (b) through the relationship determined in step (a) to ascertain the concentration of methotrexate in the test sample.

3,981,984

COLOR FILM COATING OF TABLETS AND THE LIKE

Charles A. Signorino, King of Prussia, Pa., assignor to Colorcon Incorporated, West Point, Pa.

Continuation-in-part of Ser. No. 717,984, April 1, 1968, abandoned. This application June 30, 1972, Ser. No. 268,014

Int. Cl.[2] A61K *9/32, 9/34, 9/36, 9/38;* C08K *1/14, 1/26*

U.S. Cl. 424—33 32 Claims

1. A high-concentration pigment suspension for a polymer film coating of tablets and the like comprising a non-aqueous solvent, pigment particles dispersed in the solvent, and an edible protective colloid coating the pigment particles, said colloid being about 2.5% by weight of the pigment particles, and the percentage of solids in the suspension being about 39–47%.

3,981,985

POSITIVE-WORKING ELECTRON RESISTS

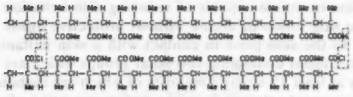
Edward David Roberts, Salfords, near Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 12, 1973, Ser. No. 424,113

Claims priority, application United Kingdom, Dec. 21, 1972, 59063/72

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—43 8 Claims



1. A cross-linkable positive working electron resist comprising a mixture of copolymers A - B and D - E wherein:

A is an unsaturated carboxylic acid of the formula

B is an unsaturated organic compound of the formula

D is an unsaturated acid chloride of the formula

and

E is an unsaturated compound of the formula

wherein R_1, R_2, R_3, R_4, R_6, R_7, R_8 and R_9 are each moieties selected from the group consisting of aryl, alkyl and hydrogen, R_5 and R_{10} are each moieties selected from the group consisting of alkyl, saturated acyloxy, aryl and -COOR wherein R is alkyl, wherein the mixture contains essentially stoichiometric + or −50% quantities of A and D and wherein from 0.5 – 7.5 mol % of the mixture consists of A.

3,981,986

ZIRCONIUM-ALUMINUM-POLYOL BUFFERED ANTI-PERSPIRANT COMPLEXES

Andrew M. Rubino, New Providence, N.J., assignor to Armour Pharmaceutical Company, Phoenix, Ariz.

Continuation-in-part of Ser. No. 418,712, Nov. 23, 1973. This application Jan. 8, 1974, Ser. No. 431,639

Int. Cl.[2] A61K *7/00, 9/00;* C07F *7/00*

U.S. Cl. 424—47 14 Claims

1. An astringent, water soluble complex formed by reacting in an aqueous medium:

a. a basic aluminum-polyol compound, selected from the group consisting of complexes having the following general empirical formulas:

$$Al_2(H_2O)_{6-y}(OH)_{6-nx-z}(A)_n(R)_z \quad (1)$$

wherein A is selected from the group consisting of chloride, bromide, iodide, sulfate and sulfamate; R is the coordinating moiety of a polyhydroxy compound having a carbon chain in which at least two carbon atoms link a hydroxyl group to said chain; n is a positive integer of from 1 to 4; x is the valence of A, y has a value of about 0.5 to 6 and is always such that $(y-z)$ does not give a negative value; and z is the number of available coordination sites, with nx being from 1 to 4,

$$nQ.Al_2(OH)_{6-b}A_{1-2}R_{1-t}(H_2O)_{0.5-t}$$

wherein Q is selected from the group consisting of zinc chloride, zinc iodide, zinc bromide, zinc hydroxy chloride, zinc hydroxy iodide, zinc hydroxy bromide, zirconyl chloride, zirconyl bromide, zirconyl iodide, zirconyl hydroxy bromide, zirconyl hydroxy iodide and zirconyl hydroxy chloride; A is an anion selected from the group consisting of chloride, bromide and iodide; R is the coordinating moiety of a polyhydroxy compound having at least two carbon atoms to which are attached at least two hydroxy groups, and n is the number of moles of Q and is at least 0.05, and

mixtures of (1) and (2);

b. a zirconium compound selected from trioxodizirconium salts and the group having the general empirical formula:

$$ZrO(OH)_{2-nz}B_z$$

wherein z may vary from 0.9 to 2, n is the valence of B, $2-nz$ is greater than or equal to **0**, and B is selected from the group consisting of halide, nitrate, sulfamate, sulfate and mixtures thereof; and

c. an organic buffer selected from the group consisting of urea, an amino acid in which the number of amino groups is equal to the number of carboxyl groups in the molecule, an alkaline salt of said amino acids, hydroxy aluminum salt of said amino acid, and mixtures thereof, said zirconium and basic aluminum-polyol compounds being present in such amounts as to yield an Al/Zr mole ratio of about 10:1 to 1:10, and said organic buffer being present in such an amount that the pH of a 5 to 15 weight percent (based on the oxides of Al and Zr) aqueous solution of the complex is at least about 3;

and drying the reaction mixture to a friable solid which is said complex.

12. An aerosol anti-perspirant composition comprising an aerosol propellant, water, ethanol, and the complex according to claim 1, wherein said complex is present in an amount of about 5 to 15 weight percent of the anti-perspirant composition.

3,981,987

HAIR SETTING COMPOSITIONS CONTAINING EASILY REMOVABLE NEUTRALIZED COPOLYMERS

Wolfgang Linke; Karl Herrle; Wolfgang Schwarz, all of Ludwigshafen, and Johannes Perner, Neustadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 8, 1975, Ser. No. 539,417

Claims priority, application Germany, Feb. 1, 1974, 2404793

Int. Cl.² A61K *7/11*

U.S. Cl. 424—47 **10 Claims**

1. A hair setting composition capable of producing a film on hair which can be washed off with water which comprises a 1 to 4% solution by weight of a water soluble polymeric resin in a solvent composed of one or more compounds selected from the group consisting of water and lower aliphatic alcohols wherein said resin is a copolymer of:

a. from 20 to 95% by weight of at least one compound selected from the group consisting of vinyl esters of aliphatic carboxylic acids of 2 to 20 carbon atoms and esters of acrylic and methacrylic acid with aliphatic alcohols of 1 to 6 carbon atoms, and

b. from 80 to 5% by weight of at least one compound selected from the group consisting of the half-esters of ethylenically unsaturated dibasic carboxylic acids of 4 to 5 carbon atoms with aliphatic alcohols of 6 to 24 carbon atoms;

which copolymer has been neutralized with from 10 to 150% by weight of the calculated theoretical amount of an inorganic or an organic base and wherein said copolymer, when measured as a 1% solution in isopropanol, has a relative viscosity of from 1.0 to 1.5.

7. The composition as set forth in claim 1 wherein the solvent additionally contains a halogenated hydrocarbon propellant gas.

3,981,988

DENTIFRICE INCLUDING A LUSTRE IMPARTING AGENT

Peter John Newman, Maidenhead, and Charles Andrew Watson, Ruislip, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,330

Claims priority, application United Kingdom, Apr. 11, 1973, 17292/73

Int. Cl.² A61K *7/16*

U.S. Cl. 424—49 **3 Claims**

1. A toothpaste composition comprising in said toothpaste from about 5% to about 60% by weight of an abrasive cleaning agent having an average particle size of about 5 to about 25 microns, said abrasive cleaning agent being selected from the group consisting of silica xerogels, hydrated alumina, calcium carbonate, stabilized non-corrosive dicalcium phosphate, insoluble sodium metaphosphate and calcium pyrophosphate and a lustre agent of from about 0.1% to about 40% by weight of pyrogenic alumina, which consists predominantly of the gamma crystalline form, obtained by the flame-hydrolysis process in which aluminum chloride is reacted with hydrogen and oxygen in a flame, said alumina having a particle size of from about 10 to about 100 millimicrons.

3,981,989

ORAL PREPARATION

Nobuo Suganuma, Funabashi; Kunio Saito, Kasukabe; Masaki Koshimizu, Chiba; Nobuyuki Takada, Chigasaki, and Reiko Takamuro, Tokyo, all of Japan, assignors to The Lion Dentifrice Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 481,230, June 20, 1974, abandoned. This application Jan. 21, 1976, Ser. No. 651,178

Claims priority, application Japan, Nov. 26, 1973, 48-131648

Int. Cl.² A61K *7/18, 7/28*

U.S. Cl. 424—50 **8 Claims**

1. An oral preparation which comprises a non-toxic vehicle and the combination of dextranase and gelatin or peptone, wherein the amount of dextranase in said oral preparation is 5000 – 1,500,000 units per gram of the oral preparation and wherein said gelatin or peptone is present in said oral preparation in amounts of 0.3 – 3 wt%.

3,981,990

SKIN PROTECTIVE COMPOSITIONS

Ralph Kelly, Cincinnati, and Edmond Jean Ritter, Loveland, both of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Division of Ser. No. 46,561, June 15, 1970, which is a continuation-in-part of Ser. No. 696,509, Jan. 9, 1968, Pat. No. 3,630,934, which is a continuation-in-part of Ser. No. 613,095, Feb. 1, 1967, Pat. No. 3,538,009. This application Feb. 4, 1974, Ser. No. 439,118

Int. Cl.² A61K *31/74*

U.S. Cl. 424—78 **9 Claims**

1. A skin protective lotion or creme consisting essentially of a skin irritation reducing effective amount of protective agent and a non-aqueous emollient, a humectant or a surfactant; said lotion or creme capable of reducing skin irritation compared to said lotion or creme without protective agent when applied to the skin prior to contact with a skin irritant; said protective agent containing two polar groups which are separated by at least 15 atoms a majority of which are carbon; said protective agent selected from the group consisting of:

A. the product obtained from the polymerization of 2 to 4 molecules of a monomeric ethylenically unsaturated C_{12} to C_{26} fatty acid, wherein the 2 to 4 carboxyl groups of the polymerization product have been converted to polar groups selected from the group consisting of hydroxyl; unsubstituted amino; substituted amino wherein the substituents are aliphatic radicals of 1 to 12 carbon atoms; unsubstituted amido; substituted amido wherein the substituents are aliphatic radicals of 1 to 12 carbon atoms, or said substituents taken together form a 3 to 6 membered ring with the amido nitrogen; and quaternary ammonium wherein the nitrogen substituents are alkyl of 1 to 6 carbon atoms; and

B. the hydrogenated derivatives of (A).

3,981,991

STABILIZATION OF INTERFERON

William Edgar Stewart, Herent, and Pierre Marie Hendrik Frans de Somer, Leuven, both of Belgium, assignors to Stichting REGA V.Z.W., Leuven, Belgium

Filed Apr. 3, 1975, Ser. No. 564,723

Claims priority, application Netherlands, Apr. 3, 1974, 7404589

Int. Cl.² A61K *45/02*

U.S. Cl. 424—85 **7 Claims**

1. A method of stabilising interferon, comprising the following steps:

a. providing an aqueous interferon solution comprising from about 10^1 to about 10^6 interferon units per milliliter and having lost substantially none of its initial activity; and

b. treating said interferon solution with a combination of:

i. urea or guanidine-hydrochloride as an agent for disrupting non-covalent bonds;
ii. mercaptoethanol or ethanethiol as an agent for reducing disulfide bridges; and
iii. an agent selected from the group consisting of sodium dodecylsulfate, sodium decylsulfate, sodium dodecylsulfonate, dodecylamine and decylamine as a surface-active agent; said three agents being used in such amounts that the resulting solution comprises from 0.1 to 10M of urea or guanidine-hydrochloride, at least 10^{-2}M of mercaptoethanol or ethanethiol, and a one-fold to fivefold excess of said surface-active agent calculated on the total amount of proteins in solution, respectively; so as to obtain an aqueous interferon solution which has been stabilised against activity losses.

3,981,992

DERIVATIVES OF 3β-(4'-OXO-α-L-RHAMNOSYL)-14β-HYDROXY-BUFA-4,20,22-TRIENOLIDE

Walter Lösel, Ingelheim am Rhein; Werner Traunecker, Munster-Sarmsheim, and Wolfgang Hoefke, Budenheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

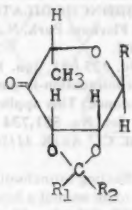
Filed July 30, 1975, Ser. No. 600,433

Claims priority, application Germany, Aug. 5, 1974, 2437693

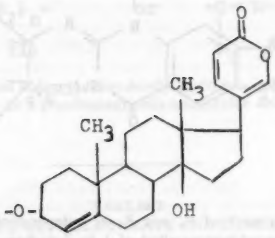
Int. Cl.² A61K *31/705*

U.S. Cl. 424—182 **9 Claims**

1. A compound of the formula



wherein
R is



R_1 is hydrogen or alkoxy of 1 to 4 carbon atoms, and
R_2 is alkoxy of 1 to 4 carbon atoms, or
R_1 and R_2 together are oxygen.

8. A cardiotonic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective cardiotonic amount of a compound according to claim 1.

3,981,993

O-ALKYL-O-N-PROPYL-O-PYRIMIDIN(2)YL-THIONOPHOSPHORIC ACID ESTERS

Fritz Maurer, Wuppertal; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

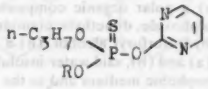
Filed Mar. 12, 1975, Ser. No. 557,699

Claims priority, application Germany, Mar. 28, 1974, 2415058

Int. Cl.² C07F *9/65*; A01N *9/36*

U.S. Cl. 424—200 **9 Claims**

1. An O-alkyl-O-n-propyl-O-pyrimidin(2)yl-thionophosphoric acid ester of the formula



in which R is methyl or ethyl.

3,981,994

O-ALKYL-O-[1-PHENYL-5-CYANOALKYLMERCAPTO-1,2,4-TRIAZOL(3)YL]-THIONOPHOSPHORIC(PHOSPHONIC) ACID ESTERS

Hellmut Hoffmann, Wuppertal; Ingeborg Hammann, Colonge, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

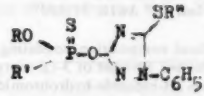
Filed Jan. 9, 1975, Ser. No. 539,898

Claims priority, application Germany, Jan. 26, 1974, 2403711

Int. Cl.² A01N *9/36*; C07F *9/165*, *9/40*

U.S. Cl. 424—200 **9 Claims**

1. An O-alkyl-O-triazolyl-thionophosphoric-(phosphonic) acid ester of the formula



in which
R is alkyl with 1 to 6 carbon atoms,
R' is alkyl or alkoxy with in either case 1 to 6 carbon atoms, and
R'' is cyanoalkyl with 1 to 4 carbon atoms.

3,981,995

PROCESS FOR CONTROL OF SHEEP MAGGOT FLY

Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 6, 1975, Ser. No. 556,049

Int. Cl.² A01N *9/36*

U.S. Cl. 424—219 **1 Claim**

1. A process for the control of larvae of *Lucilia sericata* or *Lucilia cuprina* comprising the external application to sheep of an insecticidally effective amount of the compound S-propargyl-O-benzyl, ethylphosphonodithioate.

3,981,996

PHARMACEUTICAL SKIN COMPOSITIONS

Steven Leigh, South Croydon, England, assignor to Vymatt S.A., Lugano, Switzerland

Continuation-in-part of Ser. No. 334,274, Feb. 21, 1973, abandoned. This application June 20, 1974, Ser. No. 481,449

Int. Cl.² A61K *31/56, 37/48, 47/00*

U.S. Cl. 424—243 11 Claims

1. A pharmaceutical composition, suitable for external application to human skin, which composition comprises a continuous hydrophobic phase of a pharmaceutically acceptable liquid, semi-solid, gel or solid material, having dispersed therein a pharmaceutically acceptable water-insoluble powder the particles of which carry adsorbed thereon an aqueous solution or dispersion of a member selected from the group consisting of (a) a polar organic compound selected from urea, dimethylsulphoxide, dimethylacetamide, dimeltylformamide, and tetrahydrofurfuryl alcohol, (b) a medicament and (c) mixtures of (a) and (b), said water-insoluble powder being inert to the hydrophobic medium and to the medicament and having an average particle size of greater than about 1 micron, and wherein the proportion of hydrophobic phase is from 20% to 80% by weight of the composition, the proportion of inert powder is from 5% to 60 % by weight of the composition, and the proportion of aqueous solution or dispersion is from 5% to 40% by weight of the composition.

3,981,997

ANALGESIC COMPOSITIONS COMPRISING 1H- OR RESPECTIVELY 2H-INDAZOLONE-3 (β-MORPHOLINO-ALKOXY) COMPOUNDS

Herbert Oelschlager; Uwe Matthiesen, both of Frankfurt am Main, and Wilhelm A. Behrendt, Niederweimar, Kr Marburg, Germany, assignors to Temmler Werke-Vereinigte Chemische Fabriken, Marburg, Lahn, Germany

Continuation of Ser. No. 485,633, July 3, 1974, abandoned, which is a continuation of Ser. No. 163,508, July 16, 1971, abandoned. This application May 16, 1975, Ser. No. 578,270

Claims priority, application Germany, July 17, 1970, 2035494; July 10, 1971, 2134592

Int. Cl.² A61K *31/535*

U.S. Cl. 424—248 3 Claims

1. A pharmaceutical composition consisting essentially of an analgesically effective amount of 3-(β-morpholino-ethoxy)-4,5,6,7-tetrahydro-2H-indazole-hydrobromide and an inert carrier.

3. A pharmaceutical composition consisting essentially of an analgesically effective amount of 3-(γ-morpholino-propoxy)-iH-indazole or the hydrochloride thereof and an inert carrier.

3,981,998

BACTERICIDAL AND FUNGICIDAL 1,3,5 TRIALKANOL TRIAZINES

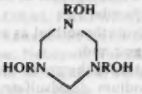
David A. Waldstein, 622 Bergen Ave., Jersey City, N.J. 07304

Filed Mar. 8, 1974, Ser. No. 449,368

Int. Cl.² A01N *9/22*

U.S. Cl. 424—249 14 Claims

1. A composition useful as a bactericide and fungicide, said composition comprising a carrier and, as the active ingredient, a bactericidally and fungicidally effective amount of a mixture of 1,3,5 variegated and non-variegated trialkanol triazines of the formula



wherein each R is an alkyl moiety having from 1 to 4 carbon atoms, formed by mixing two or more monoalkanol amines having 1 to 4 carbon atoms and reacting said mixture with a stoichiometric amount of paraformaldehyde at a temperature of between 75° to 110°C under vacuum until the water produced by the reaction is substantially removed.

3,981,999

FISH DISEASE TREATMENT

Masanao Shimizu, Toyonaka; Yoshiyuki Takase, Amagasaki, and Kaoru Kouno, Nishinomiya, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Filed Oct. 10, 1974, Ser. No. 513,824

Claims priority, application Japan, Oct. 13, 1973, 48-115006

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 13 Claims

1. A method for controlling a bacteria-caused infectious disease in fish which comprises administering a composition of 5,8-dihydro-2-pyrrolidino-8-ethyl-5-oxopyrido[2,3-d]pyrimidine-6-carboxylic acid or its non-toxic acid-addition salt in a suitable carrier to said fish in an amount effective to prevent or control said infectious disease.

3,982,000

ALKYL-SUBSTITUTED-TRICYCLIC QUINAZOLINONES AS BRONCHODILATORS

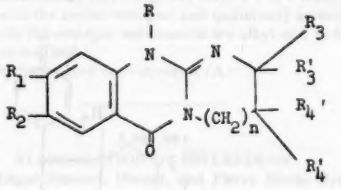
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 325,081, Jan. 19, 1973, Pat. No. 3,905,976, which is a continuation-in-part of Ser. No. 201,982, Nov. 24, 1971, abandoned. This application Feb. 21, 1975, Ser. No. 551,734

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 11 Claims

1. The method of effecting bronchodilation in animals comprising administering to an animal a bronchodilating effective amount of a compound of the formula:

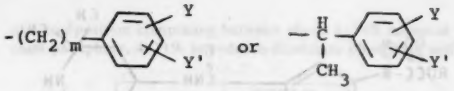


wherein each of R_1 and R_2 is, independently, hydrogen, fluoro, chloro or alkyl of 1 to 3 carbon atoms, or are either both hydroxy or both an alkoxy of 1 to 2 carbon atoms; or one is hydrogen and the other bromo, hydroxy or alkoxy of 1 to 2 carbon atoms;

n is 0 or 1,

each of R_3, R_3', R_4 and R_4' is hydrogen or alkyl of 1 to 3 carbon atoms provided that at least one but not more than three of R_3, R_3', R_4 and R_4' is alkyl,

R is alkyl of 1 to 5 carbon atoms,



m is 1 or 2, and

each of Y and Y′ is, independently, hydrogen, fluoro, chloro or alkyl of 1 to 3 carbon atoms, or either both are hydroxy or both alkoxy of 1 to 2 carbon atoms; or one is hydrogen and the other bromo, hydroxy or alkoxy of 1 or 2 carbon atoms, provided that no more than two of R_1, R_2, Y and Y′ are hydroxy, further provided that neither of R_1 and R_2 is hydroxy when either of Y and Y′ is alkoxy and further provided that neither of Y and Y′ is hydroxy when either of R_1 and R_2 is alkoxy, or a pharmaceutically acceptable acid addition salt thereof.

3,982,001

4-(3.4-METHYLENE DIOXY PHENYL)-PIPERIDINES

Wilhelm Heffe, Neuenegg; Fritz Hunziker, and Klaus Thoma, both of Berne, all of Switzerland, assignors to Sandoz, Inc., E. Hanover, N.J.

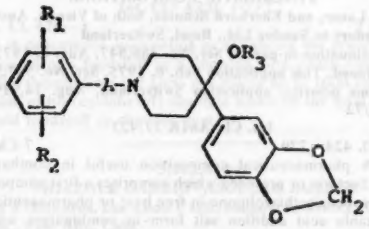
Filed Sept. 19, 1974, Ser. No. 507,449

Claims priority, application Switzerland, Sept. 25, 1973, 13718/73

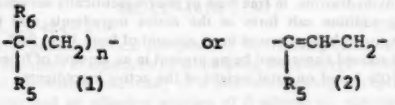
Int. Cl.² C07D *405/04*

U.S. Cl. 424—267 **39 Claims**

1. A compound of the formula,



wherein R_1 and R_2 are the same or different and are in each case hydrogen, halogen, lower alkyl, hydroxy or lower alkoxy R_3 is hydrogen and A stands for groups of formula



wherein R_5 and R_6 are independently, hydrogen or methyl and *n* is 0,1 or 2, or a pharmaceutically acceptable acid addition salt thereof.

3,982,002

VINCAMINE 2-KETOGLUTARATE AND COMPOSITIONS CONTAINING VINCAMINE 2-KETOGLUTARATE

Fernando Montoro; Antonio Vila-Coro, and Jose Calatayud, all of Madrid, Spain, assignors to Especialidades Latinas Medicamentos Universales S.A., Madrid, Spain

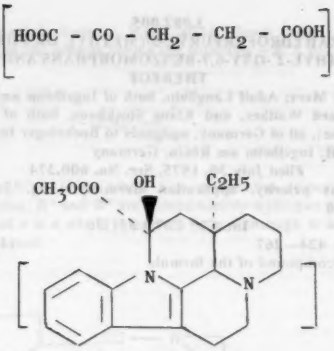
Filed Feb. 5, 1975, Ser. No. 547,191

Claims priority, application France, Sept. 6, 1974, 74.30299

Int. Cl.² C07D *401/04*

U.S. Cl. 424—267 **3 Claims**

1. Vincamine 2-ketoglutarate of the following formula:



3,982,003

GELLING AND THICKENING AGENTS

John Richard Mitchell, East Leake; Keith Buckley, Melton Mowbray, and Ian Edward Burrows, Gaddesby, all of England, assignors to Mars Limited, London, England

Filed Apr. 14, 1975, Ser. No. 568,118

Claims priority, application United Kingdom, Sept. 4, 1974, 38663/74; Oct. 8, 1974, 43500/74

Int. Cl.² A23L *1/04;* **A23K** *1/10*

U.S. Cl. 426—1 **23 Claims**

1. A food product comprising solid foodstuff and an aqueous phase, the aqueous phase having a pH value in the range 5 to 8.5 and being thickened or gelled by a deesterified natural pectin source material containing at least 5% pectic substance having a degree of esterification below 20%.

3,982,004

METHOD OF MANUFACTURING EDIBLE SOY PROTEIN-CONTAINING, SIMULATED MEAT PRODUCT

Shizuo Obata, Kashiwara; Yukiomi Yamato, and Hitoshi Taniguchi, both of Osaka, all of Japan, assignors to Fuji Oil Company, Ltd., Japan

Filed Mar. 4, 1975, Ser. No. 555,130

Claims priority, application Japan, Mar. 11, 1974, 49-28225

Int. Cl.² A23L *1/31;* **A23J** *3/00*

U.S. Cl. 426—641 **11 Claims**

1. A method of manufacturing an edible soy protein containing, simulated meat product, which comprises mixing 10 to 50% by weight a fibrous soy protein product of fibril structure having a random orientation obtained by heating a slurry of proteinaceous material through a heat exchanger under high pressure with subsequent cooling and pumping into a collecting zone so as to produce elongated filaments of multimolecular polymers with 90 to 50% by weight of a non-textured protein paste capable of gelation when heated, shaping the mixture of said fibrous soy protein product and said non-textured material and subsequently heat-treating said shaped mixture to produce said simulated meat product.

3,982,005

2-TETRAHYDROFURFURYL-5-(METHYL OR PHENYL)-9β-METHYL-2'-OXY-6,7-BENZOMORPHANS AND SALTS THEREOF

Herbert Merz; Adolf Langbein, both of Ingelheim am Rhein; Gerhard Walther, and Klaus Stockhaus, both of Bingen (Rhine), all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

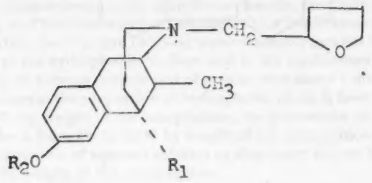
Filed July 30, 1975, Ser. No. 600,374

Claims priority, application Germany, Aug. 5, 1974, 2437610

Int. Cl.[2] C07D *221/26*

U.S. Cl. 424—267 11 Claims

1. A compound of the formula



wherein R_1 is methyl or phenyl, and

R_2 is hydrogen, methyl or acetyl,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,982,006

M-PHENYLENE DIOXAMIC ACID DERIVATIVES

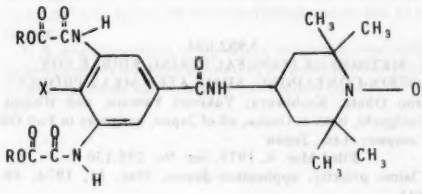
Charles M. Hall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 1, 1975, Ser. No. 618,508

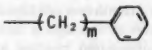
Int. Cl.[2] C07D *211/94, 211/66*

U.S. Cl. 424—267 11 Claims

1. A compound of the formula



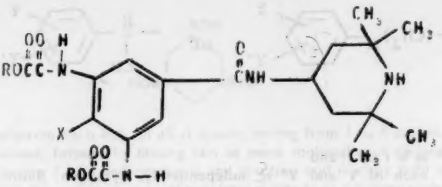
wherein R is selected from the group consisting of hydrogen, alkyl of one to eight carbon atoms, inclusive,



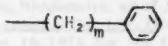
wherein *m* is 1 or 2 and a physiologically acceptable metal or amine cation;

X is selected from the group consisting of hydrogen, methyl, fluoro, chloro and bromo.

7. A compound of the formula



or a physiologically acceptable acid addition salt thereof wherein R is selected from the group consisting of hydrogen, alkyl of one to eight carbon atoms, inclusive,



wherein *m* is 1 or 2 and a physiologically acceptable metal or amine cation;

X is selected from the group consisting of hydrogen, methyl, fluoro, chloro and bromo.

3,982,007

SYNERGISTIC COMPOSITIONS

Georg Laber, and Eberhard Schutze, both of Vienna, Austria, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 386,847, Aug. 8, 1973, abandoned. This application Feb. 6, 1975, Ser. No. 547,545

Claims priority, application Switzerland, Aug. 14, 1972, 12008/72

Int. Cl.[2] A61K *31/425*

U.S. Cl. 424—270 7 Claims

1. A pharmaceutical composition useful in combatting fungi, bacteria or protozoa which comprises a first compound 6-chlorobenzisothiazolinone in free base or pharmaceutically acceptable acid addition salt form in combination with a second compound selected from the group consisting of 2-(2-chlorophenyl)-3-(5-nitro-2-furyl) acrolein guanylhydrazone, 2-(4-bromophenyl)-3-(5-nitro-2-furyl) acrolein guanylhydrazone, and 2-(4-chlorophenyl)-3-(5-nitro-2-furyl) acrolein guanylhydrazone, in free base or pharmaceutically acceptable acid addition salt form as the active ingredients said first compound being present in an amount of from 10 to 90% and said second compound being present in an amount of from 90 to 10% based on total weight of the active ingredients.

3,982,008

CALCIUM PHOSPHATE AND CALCIUMCHLOROPHOSPHATE COMPOSITIONS

Ashok Babubhai Amin, Ahmedabad, India, assignor to American Cyanamid Company, Stamford, Conn.

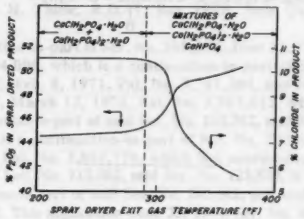
Continuation-in-part of Ser. No. 170,941, Aug. 11, 1971, which is a division of Ser. No. 791,944, Jan. 17, 1969, Pat. No. 3,652,206. This application Nov. 9, 1973, Ser. No. 414,588

Int. Cl.[2] A23K *1/175*

U.S. Cl. 426—2 2 Claims

2. A method for supplementing the phosphorus content in an animal's diet which comprises administering to the animal in the diet fed to the animal biologically acceptable amounts

of a composition comprising between about 1–73% monocalcium phosphate, 4–21% anhydrous dicalcium phosphate and



22–95% calcium chlorophosphate, the composition having a P/F ratio of 100 or greater.

3,982,009

GRAPE FLAVOR COMPOSITIONS, FOODSTUFFS AND CHEWING GUM CONTAINING BIS (CYCLOHEXYL) DISULFIDE AND METHODS FOR PRODUCING SAME

Gary Slangan, Toms River; Alan O. Pittet, Atlantic Highlands; Christopher Giacino, Califon; Denis E. Hruza, Sr., Bricktown, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 518,818, Oct. 29, 1974, Pat. No. 3,917,870, which is a continuation-in-part of Ser. No. 401,665, Sept. 28, 1973, abandoned. This application Aug. 12, 1975, Ser. No. 603,918

Int. Cl.² A23L *1/235*

U.S. Cl. 426—3 **2 Claims**

1. A process for augmenting or enhancing the grape flavor or aroma of a foodstuff or a chewing gum which comprises adding thereto from 0.2 parts per billion up to 1000 parts per million of bis (cyclohexyl) disulfide based on the total weight of said foodstuff or chewing gum.

3,982,010

THIAZOLE CARDIOVASCULAR AGENTS

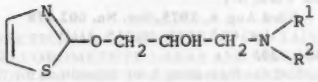
John A. Edwards, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 289,730, Sept. 15, 1972, Pat. No. 3,850,945, which is a continuation-in-part of Ser. No. 193,172, Oct. 27, 1971, abandoned. This application Sept. 19, 1974, Ser. No. 507,651

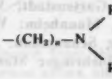
Int. Cl.² A61K *31/425*

U.S. Cl. 424—270 **7 Claims**

1. A pharmaceutical composition, for treating cardiovascular disorders in mammals by stimulating β-adrenergic receptor sites, consisting essentially of a pharmaceutically acceptable carrier and an effective amount of β-adrenergic stimulating agent selected from the group consisting of a pharmaceutically acceptable salt of a compound having the formula



wherein one of R^1 or R^2 is hydrogen and the other is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl having 3 through 7 ring atoms, lower alkenyl, phenyl, phenylalkyl having up to 12 carbon atoms, alkylphenyl having up to 12 carbon atoms, α-methyl-β-phenylethyl, β-(3,4-dimethoxyphenyl)-ethyl, hydroxy lower alkyl, (lower alkoxy) lower alkyl, and the groups having the formulas —R′X or



wherein R′ is lower alkyl, X is morpholine, piperidine or pyrrolidine, R^7 and R^8 are independently hydrogen or lower alkyl and *n* is a whole integer of from 1 through 4; and mixtures thereof.

3,982,011

PENICILLINS

Gunter Schmidt, and Karl Georg Metzger, both of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

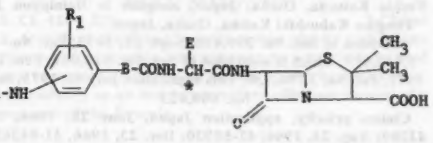
Division of Ser. No. 419,950, Nov. 29, 1973, Pat. No. 3,931,153. This application June 11, 1975, Ser. No. 585,890

Claims priority, application Germany, Dec. 8, 1972, 2260118

Int. Cl.² C07D *499/68, 499/70*

U.S. Cl. 424—271 **21 Claims**

1. A pharmaceutical composition for combatting infections in animals and humans comprising an antibacterially effective amount of a compound selected from the group consisting of a penicillin of the formula:



and the pharmaceutically acceptable nontoxic salts thereof wherein

the carbon atom designated by * is asymmetrically substituted;

R_1 is hydrogen, halo, lower alkyl, hydroxy, nitro or A—NH—;

A is R_3CO— or R_4CS— in which

R_3 is hydrogen; lower alkyl; halo(lower alkyl); cycloalkyl of 3 to 11 carbon atoms unsubstituted or substituted by hydroxy or alkyl of 1 or 2 carbon atoms; cycloalkenyl of 3 to 11 carbon atoms; bicycloalkyl of up to 8 carbon atoms; bicyloalkenyl of up to 8 carbon atoms; aryl of 6 to 10 carbon atoms, unsubstituted or substituted by from 1 to 3 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halo, trifluoromethyl, nitro, amino and alkylsulfonyl of 1 to 4 carbon atoms, or substituted by methylenedioxy, azidoaryl of 6 to 10 carbon atoms; azido(lower alkyl); amino; or thienyl; and

R_4 is lower alkylamino or arylamino of 6 to 10 carbon atoms;

B is a direct bond or —CH=CH-; and

E is phenyl; phenyl substituted by hydroxy, azido, lower alkyl, lower alkoxy, lower alkylthio or chloro; or thienyl,

in combination with a pharmaceutical carrier.

3,982,012
4-HYDROXY-BENZIMIDAZOLE COMPOUNDS AND THERAPEUTIC COMPOSITIONS

Erich Fauland, Mannheim-Gartenstadt; Wolfgang Kampe, Heddesheim; Max Thiel, Mannheim; Wolfgang Bartsch, Viernheim, and Wolfgang Schaumann, Heidelberg, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

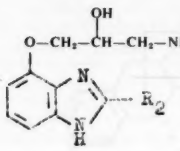
Filed June 10, 1975, Ser. No. 585,645

Claims priority, application Germany, July 5, 1974, 2432269

Int. Cl.² C07D *235/08*

U.S. Cl. 424—273 **14 Claims**

1. 4-Hydroxy-benzimidazole compound of the formula:



(I)

wherein

R_1 is straight-chained or branched alkyl of up to 6 carbon atoms and

R_2 is hydrogen atom or lower alkyl of up to 3 carbon atoms and the pharmacologically compatible salts thereof.

3,982,013
5-PHENYLVINYLFURFURYLESTER OF CHRYSANTHEMUMIC ACID

Yoshio Katsuda, Osaka, Japan, assignor to Dainippon Jochugiku Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 399,418, Sept. 21, 1973, Pat. No. 3,932,470, which is a division of Ser. No. 112,061, Feb. 2, 1971, Pat. No. 3,796,730. This application July 30, 1975, Ser. No. 600,423

Claims priority, application Japan, June 28, 1966, 41-42289; Aug. 24, 1966, 41-55930; Dec. 23, 1966, 41-84365

Int. Cl.² C07D *307/12*

U.S. Cl. 424—285 **5 Claims**

1. 5-phenylvinyl-furfurylester of chrysanthemumic acid.

3,982,014
ARTHROPOD MATURATION INHIBITORS

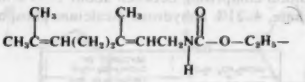
Meyer Schwarz, Kensington; Philip E. Sonnet, Bowie, and Nobel Wakabayashi, New Carrollton, all of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 436,239, Jan. 24, 1974, Pat. No. 3,904,773, which is a division of Ser. No. 104,781, Jan. 7, 1971, Pat. No. 3,824,319. This application Mar. 24, 1975, Ser. No. 561,586

Int. Cl.² A01N *9/12*

U.S. Cl. 424—300 **2 Claims**

1. A method of preventing the maturation of *Tenebrio molitor pupae* comprising applying to the pupae a maturation inhibiting amount of a compound of the formula



3,982,015
N-PROPARGYL-ANILINOMETHYLENEMALODINITRILE DERIVATIVES

Jozef Drabek, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

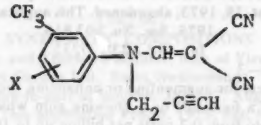
Filed Aug. 5, 1975, Ser. No. 602,055

Claims priority, application Switzerland, Aug. 14, 1974, 11137/74; Aug. 14, 1974, 11138/74; June 25, 1975, 8253/75

Int. Cl.² A01N *9/20*; **C07C** *121/78*

U.S. Cl. 424—304 **15 Claims**

1. Compounds of the formula I



(I)

wherein X represents trifluoromethyl, chlorine, fluorine, bromine or iodine.

7. An insecticidal composition which contains as active component an insecticidally effective amount of a compound according to claim 1, together with a suitable carrier therefor.

3,982,016
BONE DEPOSITION BY 16-ARYL-13,14-DIHYDRO-PGE$_2$ p-BIPHENYL ESTERS

Alexander H. Walsh, Old Saybrook, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 6, 1975, Ser. No. 602,478

Int. Cl.² A61K *31/215*, *31/19*

U.S. Cl. 424—305 **2 Claims**

1. A method for increasing bone deposition for the treatment of osteopenia which comprises administering to a subject afflicted with bone loss a bone deposition increasing amount of a 16-aryl-13,14-dihydro-PGE$_2$ p-biphenyl ester wherein the aryl group of said 13,14-dihydro-PGE$_2$ p-biphenyl ester is phenyl; α- or β-naphthyl; dimethoxy phenyl; 3,4-methylenedioxyphenyl; 3,4,5-trimethoxyphenyl or mono-substituted phenyl wherein said substituent is chlorine, bromine, fluorine, trifluoromethyl, phenyl, methyl or methoxy.

3,982,017

INJECTABLE SOLUTIONS AND PROCESSES OF USING SUCH

Geraldine H. Thiele, R.D. 1, Box 191B, New Oxford, Pa. 17350

Continuation-in-part of Ser. No. 369,236, June 12, 1973, Pat. No. 3,924,000, which is a continuation-in-part of Ser. Nos. 113,362, Feb. 8, 1971, Pat. No. 3,741,204, and Ser. No. 123,830, March 12, 1971, Pat. No. 3,767,812, which is a continuation-in-part of said Ser. No. 113,362, said Ser. No. 369,236, is a continuation-in-part of Ser. No. 283,662, Aug. 25, 1972, Pat. No. 3,805,776, which is a continuation-in-part of Ser. No. 113,362, said Ser. No. 123,830, is a continuation-in-part of said Ser. No. 283,662, and said Ser. No. 283,663. This application June 25, 1974, Ser. No. 483,010

The portion of the term of this patent subsequent to June 26, 1990, has been disclaimed.

Int. Cl.² A61K *31/20*

U.S. Cl. 424—318 14 Claims

1. A liquefied composition having a pH between 9 and 10 which consists of (i) 1 to 10 percent of sodium oleate, said sodium oleate being a non-necrotic sclerosing fatty acid salt, (ii) 0.1 to 5 percent of ethanol, (iii) a buffer, enough of said buffer being present to adjust the pH to the stated range, and (iv) water, said water being a liquid carrier.

3,982,018

4-ETHERS OF 3-AMINO-5-SULFAMOYLBENZOIC ACIDS

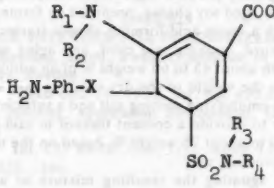
Lincoln Harvey Werner, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 386,828, Aug. 8, 1973, which is a continuation-in-part of Ser. No. 297,530, Oct. 13, 1972, Pat. No. 3,939,267. This application Oct. 4, 1974, Ser. No. 511,977

Int. Cl.² A01N *9/20*; C07C *149/40*

U.S. Cl. 424—319 8 Claims

1. A 4-phenylether of the 3-amino-5-sulfamoylbenzoic acid corresponding to the formula



(I)

in which Ph is unsubstituted phenylene or phenylene substituted by one or two lower alkyl groups, R_1 is H-Ph-lower alkyl or H-Ph-lower akenyl, R_2 is hydrogen lower alkyl, lower alkenyl or lower alkynyl, R_3 is hydrogen or lower alkyl, X is sulfur, and R_4 is hydrogen or lower alkyl, or therapeutically useful ammonium, alkali or alkaline earth metal or acid addition salts thereof.

3,982,019

INSECTICIDAL COMPOSITIONS CONTAINING TRIFLUOROMETHYL UREAS AND METHOD OF CONTROLLING INSECTS USING SAID COMPOSITIONS

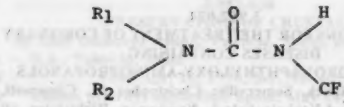
Sidney B. Richter, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 745,384, July 17, 1968, Pat. No. 3,895,061. This application Feb. 18, 1975, Ser. No. 545,651

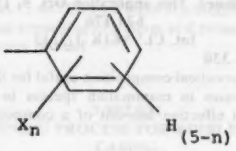
Int. Cl.² A01N *9/20*

U.S. Cl. 424—322 2 Claims

1. An insecticidal composition comprising an inert carrier and, in a quantity toxic to insects, a compound of the formula



wherein R_1 is selected from the group consisting of alkyl having up to 10 carbon atoms, alkenyl having up to 10 carbon atoms, cycloalkyl having from 4 to 8 carbon atoms and



wherein X is selected from the group consisting of lower alkyl, lower alkenyl, chlorine, bromine, lower alkoxy, lower alkylthio, di (lower alkyl) amino, nitro, cyano and thiocyano; *n* is an integer from 0 to 3; and R_2 is selected from the group consisting of hydrogen and R_1.

3,982,020

SUBSTITUTED BENZYLIDENE HYDRAZINES FOR TREATING HYPERGLYCEMIA, OBESITY AND INFLAMMATION

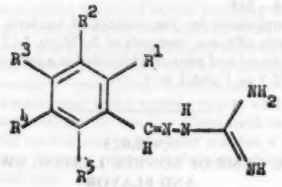
William J. Houlihan, and Robert E. Manning, both of Mountain Lakes, N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 20,418, March 17, 1970, abandoned, which is a continuation-in-part of Ser. No. 825,412, May 16, 1969, abandoned. This application Sept. 5, 1972, Ser. No. 286,320

Int. Cl.² A61K *31/155*

U.S. Cl. 424—326 2 Claims

1. A method of treating hyperglycemia, obesity and inflammation which comprises administering to a mammal in need of said treatment orally or parenterally an anti-hyperglycemic, an anti-obesity or an anti-inflammatory effective amount of a compound of the formula:



where

R^1, R^2, R^3, R^4 and R^5 are H, halo having an atomic weight of 19 to 36, trifluoromethyl, phenyl or lower alkyl, provided that

1. there are no adjacent trifluoromethyl or phenyl groups,
2. at least one of R^1, R^2, R^3, R^4 or R^5 must be other than H,
3. R^1, R^2 or R^4 is not trifluoromethyl when R^1, R^2, R^4 or R^5 are only H, halo or trifluoromethyl and R^3 is H, and
4. both R^1 and R^5 are methyl, only, when R^2, R^3 and R^4 are other than hydrogen,

or a pharmaceutically acceptable acid addition salt thereof.

3,982,021

COMPOSITIONS FOR THE TREATMENT OF CORONARY DISEASES CONTAINING TETRAHYDRONAPHTHYLOXY-AMINOPROPANOLS

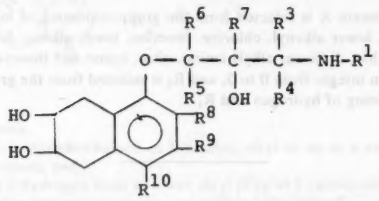
Frederic P. Hauck, Somerville; Christopher M. Cimarusti, Hamilton, and Venkatachala L. Narayanan, Hightstown, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 203,865, Dec. 1, 1971, Pat. No. 3,935,267, which is a continuation-in-part of Ser. No. 48,458, June 22, 1970, abandoned. This application Oct. 9, 1975, Ser. No. 621,176

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 4 Claims

1. A pharmaceutical composition useful for the treatment of coronary diseases in mammalian species in need thereof, comprising an effective amount of a compound having the structure



or a stereoisomer or salt thereof, wherein R^1 is lower alkyl; R^3, R^4, R^5, R^6 and R^7 are the same or different and are hydrogen or lower alkyl; and R^8, R^9 and R^{10} are the same or different and are hydrogen, lower alkyl, lower alkoxy or cycloalkyl; and a pharmaceutically acceptable carrier therefor.

3,982,022

SYNERGISTIC COMPOSITION FOR THE CONTROL OF BACTERIA

Gerhard Hool, Basel, Switzerland, and Hans Kundig, Johannesburg, South Africa, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 146,854, May 25, 1971, abandoned. This application May 15, 1974, Ser. No. 469,993

Claims priority, application Belgium, May 26, 1970, 89520

Int. Cl.² A01N *9/24*; A61K *31/09*

U.S. Cl. 424—341 4 Claims

1. A composition for the control of bacteria comprising antibacterially effective amounts of 5-chloro-2-(2,4-dichlorophenoxy)-phenol and phenethyl alcohol in a proportion within the range of 3 to 1 and 1 to 5.

3,982,023

CHEWING GUMS OF LONGER LASTING SWEETNESS AND FLAVOR

Bernard J. Bahoshy, Mahopac; Robert E. Klose, West Nyack, both of N.Y., and Harold A. Nordstrom, Reading, Mass., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 295,313, Oct. 5, 1972, Pat. No. 3,943,258. This application Dec. 29, 1975, Ser. No. 644,705

Int. Cl.² A23G *3/30*

U.S. Cl. 426—3 6 Claims

1. In a sweetened chewing gum composition which comprises gum base, flavor and major amount of sweet bulking agent selected from the group consisting of sugar, sugar alcohols and mixtures thereof and a non-dipeptide artificial sweetener in an amount sufficient to impart normal sweetness to a said gum the improvement which comprises at least 0.1% L-aspartylL-phenylalanine methyl ester by weight of the total gum composition whereby the normal sweetness and flavor is extended.

3,982,024

PRESERVATION OF ALCOHOLIC BEVERAGES

Miguel Maximo Oneto, Araoz 2260, Buenos Aires, Argentina

Filed June 23, 1972, Ser. No. 265,476

Claims priority, application Argentina, June 25, 1971, 236460; May 15, 1972, 242010; May 15, 1972, 242011

Int. Cl.² C12G *1/00*; C12C *11/04*

U.S. Cl. 426—15 10 Claims

1. A method for the preservation of alcoholic beverages from a fermentation juice of at least one neutral fermentable sugar comprising the steps of mechanically removing from said beverage the microorganisms which cause disease in said beverage and any suspended material containing such organisms, and subsequently bottling and sealing said beverage, the step of removing said microorganisms and all subsequent treatment of the beverage including its bottling and sealing being done in a circuit free of air.

3,982,025

SOY CHEESE SPREAD AND PROCESS FOR PREPARING SAME

Yukio Hashimoto, Izumiotsu, and Fumiyuki Sunada, Osaka, both of Japan, assignors to Fuji Oil Company, Ltd., Osaka, Japan

Filed Dec. 9, 1974, Ser. No. 530,850

Claims priority, application Japan, Dec. 11, 1973, 48-139191

Int. Cl.² A23L *1/20*

U.S. Cl. 426—46 8 Claims

1. A method for making a spreadable soy cheese product without using dairy product ingredients comprising

admixing an aged soy cheese, prepared by fermenting a soy milk with a lactic acid-forming cheese starter culture to form a curd, cooking said curd, and aging said cooked curd, with about 45 to 60 weight % of an edible oil or fat, based on the weight of the dry solids in said soy cheese, a cheese emulsifying melting salt and a sufficient quantity of water to provide a content thereof in said product of about 50 to about 75 weight %, based on the total weight of said product; and

vigorously agitating the resulting mixture at an elevated temperature with sufficient mechanical shearing force to form the ingredients thereof into a liquefied, homogeneous emulsion, without causing gellation of soy globulin contained in said soy cheese, thereby forming a spreadable soy cheese product having a paste-like consistency.

3,982,026

SILAGE AID

Rudolf Fahnenstich, Mombris; Wilhelm Schuler, Bad Homburg; Herbert Tanner, Hanau, and Otto Weiberg, Neu-Isenburg, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Continuation-in-part of Ser. No. 558,685, March 17, 1975, abandoned. This application Mar. 18, 1975, Ser. No. 559,495

Claims priority, application Germany, Mar. 16, 1974, 2412834

Int. Cl.² A23K *1/00*, *3/03*

U.S. Cl. 426—54 12 Claims

1. Silage containing as an additive thereto 0.01 to 5% a propylene glycol ester of propionic acid.

3,982,027

METHOD FOR PRODUCING A FEEDING STUFF SUITABLE FOR RUMINANTS

Claus Michael Valeur, Olstykke; Peter Bisgaard-Jespersen, Birkerod, and Henning Bernstorff Schrøder, Stenlose, all of Denmark, assignors to Dansk Landbrugs Grovvareselskab A.m.b.A., Copenhagen, Denmark

Filed Sept. 18, 1974, Ser. No. 507,023

Claims priority, application Denmark, Sept. 21, 1973, 5174/73

Int. Cl.² A23K *1/22*

U.S. Cl. 426—69 8 Claims

1. A method of manufacturing a feed stuff suitable for ruminants comprising forming a liquid mixture, containing one part by weight of urea, 0.2 to 1.5 parts by weight of acetic acid, 3 to 0.25 parts by weight of molasses and water in an effective amount up to 50 percent by weight of the total liquid mixture, and intimately mixing said liquid mixture with a finely divided or ground starchy material in such proportions that the liquid mixture will amount to 15–30 percent by weight of the total mix.

3,982,028

PRESERVATIVES FOR FORAGE, HAY, GRAIN AND ANIMAL FEEDS

Francis Bellingham, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Sept. 13, 1973, Ser. No. 396,666

Claims priority, application United Kingdom, Sept. 14, 1972, 42690/72

Int. Cl.² A23K *1/00*

U.S. Cl. 426—69 7 Claims

1. Animal feedstuffs selected from the group consisting of compound feeds, feed blocks, liquid feed supplements, drenches, slow release pellets, ensiled green fodder, hay and grain, containing a mixture of isobutyraldehyde with a substance selected from the group consisting of AGS (Adipicglutaric-succinic) acid, acetic acid, formalin, sulphuric acid, and trioxane or a chlorinated mixture of isobutyraldehyde with urea.

3,982,029

PACKAGE INTENDED FOR PRESSURIZED CONTENTS

Gad A. Rausing, Lund, Sweden, assignor to Sobrefina SA, Fribourg, Sweden

Filed Oct. 10, 1973, Ser. No. 405,007

Claims priority, application Switzerland, Oct. 17, 1972, 15144/72

Int. Cl.² B65D *5/40, 5/56;* B65B *31/02*

U.S. Cl. 426—106 3 Claims

1. Package of pressurized fluid comprising at least one inner container of plastic material, a filling of pressurized fluent material within the inner container, an open-ended outer shell surrounding the inner container of a non-extensible material, wherein the inner container consists of a piece of a plastic film tube sealed off along two flat sealing seams arranged at a distance from one another transversely to the tube, the length of the sealing seams appreciably exceeding the distance between them, said sealing seams along their entire length being in contact with the inside of said shell in such a way that the sealing seams are mechanically supported by the shell in order to prevent the sealing seams from being broken by the pressure inside the inner container.

3,982,030

PRESERVATION OF CRUSTACEA

D. Luis Gutierrez Alsina, Valencia, Spain, assignor to Gutix S.A., Valencia, Spain

Filed Apr. 16, 1974, Ser. No. 461,294

Claims priority, application Spain, May 14, 1973, 414753

Int. Cl.² A23B *4/02*

U.S. Cl. 426—269 3 Claims

1. A composition for preserving crustacea by preventing melanosis, consisting essentially of about 25 to 35% by weight of magnesium carbonate, about 40 to 60% by weight of citric acid and about 15 to 25% by weight of a metabisulfite selected from the group consisting of sodium and potassium metabisulfite and mixtures thereof.

3,982,031

ALUM TANNING PROCESS FOR EDIBLE COLLAGEN CASING

Noel Ian Burke, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed Nov. 3, 1975, Ser. No. 628,260

Int. Cl.² A22C *13/00*

U.S. Cl. 426—273 7 Claims

1. In a process for producing an edible collagen casing which comprises extruding an aqueous collagen slurry through a die into an aqueous coagulating medium to form a collagen casing, tanning the coagulated casing in a tanning bath containing aluminum salts and drying to produce an edible casing product, the improvement for tanning the collagen casing which comprises immersing the coagulated casing in a tanning bath which is free of any aluminum chelating agents and contains an admixture of aluminum ammonium sulfate and monobasic aluminum sulfate at a molar ratio in the range of 1:2 to 2:1, the aluminum ammonium sulfate being present in the bath in an effective amount at a concentration of less than 3% by weight.

3,982,032

PROCESS FOR THE PRODUCTION OF RICE CRACKERS

Eiji Koizumi, Niigata, Kamedamachi, Japan, assignor to Kameda Seika Co., Ltd., Japan

Continuation of Ser. No. 418,923, Nov. 26, 1973, abandoned. This application June 3, 1975, Ser. No. 583,428

Int. Cl.² A21D *13/00*

U.S. Cl. 426—296 3 Claims

1. In a process for the production of rice-crackers using rice as the main raw material, said process consisting of washing the raw rice material; steaming and kneading the washed rice; cooling the material prepared by the steaming and kneading; extruding and cutting the cooled material to any desired size, thickness and shape; drying the shaped material; and baking or frying the dried material, followed by seasoning and drying, the improvement comprising continuously collecting the waste wash water used in the washing step to wash the rice and recirculating it for further use in washing fresh raw rice material until the recirculated wash water reaches a contaminate concentration in terms of chemical oxygen demand of up to about 40,000 ppm.

3,982,033

PROCESS FOR COATING PIZZA SHELLS WITH SAUCE

Santo Zito, Los Angeles, Calif., assignor to Fairmont Foods Company, Culver City, Calif.

Continuation-in-part of Ser. No. 880,880, Nov. 28, 1969, Pat. No. 3,631,818. This application Aug. 24, 1971, Ser. No. 174,394

Int. Cl.² A23L *1/00*

U.S. Cl. 426—302 5 Claims

1. A method for applying pizza sauce material to a plurality of pizza shells, comprising the steps of:

moving a plurality of pizza shells to a pizza sauce application position;

interrupting the movement of said pizza shells after said pizza shells reach said application position for a time period during which pizza sauce material is applied to said pizza shells;

measuring a volumetric quantity of pizza sauce material for application to the pizza shells;

supplying the measured quantity of pizza sauce material to a plurality of distribution nozzles during said time period the pizza shells are in the application position;

rotating the plurality of distribution nozzles over the pizza shells while the measured quantities of pizza sauce material are discharged therefrom; and

discharging the pizza sauce material from said distribution nozzles in a path extending along at least a substantial portion of the radii of the pizza shells while said distribution nozzles are rotated in a circle above the pizza shells.

3,982,034

FLAVORING WITH 2,4,6-TRIMETHYL-S-TRITHIANE

Richard Arnold Wilson, Edison; Ira Katz, Elberon; Manfred H. Vock, Locust, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 166,683, July 28, 1971, abandoned. This application Mar. 21, 1975, Ser. No. 560,717

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² A23L *1/231, 1/235, 1/226*

U.S. Cl. 426—535 **1 Claim**

1. A process for altering, modifying or enhancing the black currant flavor of a foodstuff having a black currant taste which comprises adding thereto from about 0.02 up to 100 parts per million by weight of a substantially pure form of 2,4,6-trimethyl-S-trithiane.

3,982,035

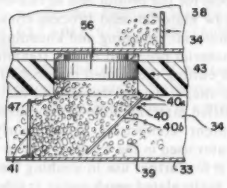
MOLDING APPARATUS AND METHOD

Gerald J. Orlowski, 7545 Ponderosa Court, Orland Park, Ill. 60462

Filed Sept. 20, 1974, Ser. No. 507,701

Int. Cl.² A23G *3/00*

U.S. Cl. 426—454 **19 Claims**



1. A method forming a patty from a mass of agglomerable material comprising the steps of:

feeding agglomerable material into a hopper;

moving said material through said hopper and substantially upwardly into a mold position in communication with said hopper until said mold is filled with said material thereby forming a patty, said mold being located in a cavity and a plurality of said cavities being positioned in spaced radial relation around the center of a rotating turret, and a lower portion of each cavity, a working bottom face on a barrier means reciprocably mounted therein, and a mold bottom opening forming the surfaces of each mold,

moving said mold out of communication with said hopper by continued rotation of said turret,

reciprocating said barrier means through said cavity to collapse said mold and discharge said patty substantially downwardly therefrom through said mold bottom, and

separating said patty from said barrier means while maintaining the shape of the patty as formed by passing the interface of said patty and said barrier means across a wire cut-off means.

2. Apparatus for forming a plurality of uniformly shaped patties from a mass of agglomerable edible material comprising:

a frame,

a drive means retained on said frame,

a hopper attached to said frame for receiving a mass of agglomerable edible material,

a turret rotatably mounted to said frame and drivingly connected to said drive means including a plurality of cavities located in spaced angular and radial relation therearound, each cavity having a barrier means mounted for reciprocal movement axially therein, each said barrier means having a bottom surface coacting with a cavity to form a mold,

means in said hopper for moving agglomerable edible material through said hopper and substantially upwardly into said mold, filling it, and forming a patty therein as each mold opening is positioned in communication with said hopper during a portion of each turret rotation, and

means coacting with the turret reciprocating said barrier means through said cavity as said turret rotates to push a patty substantially downwardly out therefrom at a portion of rotation externally of said hopper,

and means connected to the frame for separating a patty from said barrier means in a manner preventing its deformation during separation.

3,982,036

CALCIUM PHOSPHATE AND CALCIUMCHLOROPHOSPHATE COMPOSITIONS

Ashok Babubhai Amin, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 170,938, Aug. 11, 1971, which is a division of Ser. No. 791,944, Jan. 17, 1969, Pat. No. 3,652,206. This application Oct. 15, 1973, Ser. No. 406,735

Int. Cl.² A23B *4/04*

U.S. Cl. 426—471 **8 Claims**

1. A process for preparing a mixture of calcium phosphate and calcium chlorophosphate having a P/F ratio of 100 or greater which comprises:

spray-drying a solution comprising water, phosphoric acid, and calcium dichloride salt, the solution further characterized in having a solution P/F ratio of at least about 30 but less than 100 and a Ca/P mole ratio of which ranges from greater than 0.5 to about 1.0, the exit gas temperature of the spray dryer being from about 200°F. to about 380°F., and recovering the solid product therefrom.

3,982,037

PEELING FRUITS AND VEGETABLES BY MULTIPLE HEATINGS AND COOLINGS

Merle L. Weaver, Martinez; Charles C. Huxsoll, Moraga, and Robert P. Graham, El Cerrito, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 15, 1975, Ser. No. 541,318

Int. Cl.² A23L *1/212*

U.S. Cl. 426—482 **6 Claims**

1. A process for peeling a product selected from the group of fruits and vegetables which are capable of skin-slipping, which comprises

subjecting the product to multiple heatings at a temperature of 212° F, each in the absence of any caustic or acid,

subjecting the product to cooling at a temperature of about 30° to 75° F. for a period of about 1 to 5 minutes, in the absence of any caustic or acid, immediately following each heating,

wherein each of said heatings is ineffective by itself to attain loosening of the skin on the product, but wherein the said multiple heatings in the aggregate and in conjunction with the subsequent coolings yield effective loosening of the skin without cooking of the flesh of the product, and

removing the so-loosened skin from the product.

3,982,038

METHODS FOR USING 3-FURYL β-CHALOCOGENALKYL SULFIDES FOR ALTERING THE ORGANOLEPTIC PROPERTIES OF FOODSTUFFS, AND COMPOSITIONS OF MATTER CONTAINING 3-FURYL β-CHALCOGENALKYL SULFIDES

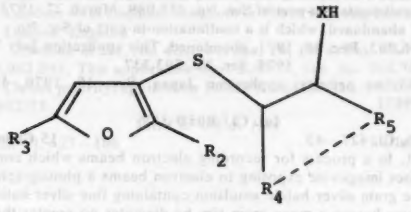
William J. Evers, Middletown; Igor A. Pelse, Long Branch, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 542,830, Jan. 21, 1975, Pat. No. 3,933,863. This application Sept. 17, 1975, Ser. No. 614,216

Int. Cl.² A23L *1/231*

U.S. Cl. 426—535 **26 Claims**

1. A food flavor composition useful for augmenting or enhancing the meaty or nutty flavor of a foodstuff comprising from 0.5 ppm up to 90 percent by weight of said composition of a 3-furyl beta chalcogenalkyl sulfide having the structure:



wherein X is a chalcogen selected from the group consisting of oxygen and sulfur; R_2 and R_3 are each selected from the group consisting of methyl and hydrogen, at least one of R_2 or R_3 being methyl; and R_4 and R_5, taken separately, are each methyl, or R_4 and R_5 taken together, are tetramethylene, and when R_4 and R_5 taken together are tetramethylene, X and S are in a trans relationship, the remainder of said composition being one or more adjuvants which are both non-reactive and organoleptically compatible with said 3-furyl beta-chalcogenalkyl sulfide and which are selected from the group consisting of:

4-methyl-5-beta-hydroxyethyl thiazole;
2-Methyl butanethiol;
4-Mercapto-4-pentanone;
1-Mercapto-2-propanone;
Benzaldehyde:
Furfural;
Furfural alcohol;
2-Mercapto-propionic acid;
Alkyl pyrazine;
Methyl pyrazine;
2-Ethyl-3-methyl pyrazine;
Tetramethyl pyrazine;
Polysulfides;
Dipropyl disulfide;
Methyl benzyl disulfide;
Alkyl thiophenes;
2-Butyl thiophene;
2,3-Dimethyl thiophene;
5-Methyl furfural;
Acetyl furan;
2,4-Decadienal;
Guiacol;
Phenyl acetaldehyde;
δ-Limonene;
Acetoin;
Amyl acetate;
Maltol;
Ethyl butyrate;
Levulinic acid;
Piperonal;
Ethyl acetate;
n-Octanal;
n-Pentenal;
Hexanal;
Diacetyl
Monosodium glutamate;
Sulfur-containing amino acids;
Cysteine;
Hydrolyzed vegetable protein;
2-Methylfuran-3-thiol;
2-Methyldihydrofuran-3-thiol;
2,5-Dimethylfuran-3-thiol;
Hydrolyzed fish protein; and
Tetramethyl pyrazine.

3,982,039

USE OF MODIFIED WHEY SOLIDS AS MARGARINE ADDITIVE AND PRODUCT THEREOF

Gabriele E. Scibelli, New Rochelle, N.Y., and Joseph Vincent Feminella, Trumbull, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 16, 1975, Ser. No. 541,559

Int. Cl.² A23D *3/02*

U.S. Cl. 426—603 **8 Claims**

1. A margarine which comprises as an ingredient in its aqueous phase from about 0.5% to about 6%, by weight of the margarine, of the dried modified whey product which is formed by drying the second fraction which is obtained by passing partially delactosed cheese whey through the bed of a molecular sieve resin and which comprises a lactose content of from about 40% to about 50%, by weight, an ash content of from about 20% to about 30%, by weight, and a protein content to about 15% to about 20%, by weight.

3,982,040

EGG WHITE COMPOSITION

Robert Edward Oborn, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 16, 1975, Ser. No. 623,135

Int. Cl.² A23L *1/32*

U.S. Cl. 426—614 **8 Claims**

1. An egg white composition comprising desugared egg white and from about 0.005% to about 1.0% by weight of the composition of an alkali metal bisulfite, said egg white composition being substantially dry.

3,982,041

HERMETICALLY SEALED RICE MIX

Gary J. Steen; Terrence A. Bedell, both of Houston, and Frank W. Myers, Cleveland, all of Tex., assignors to Riviana Foods Inc., Houston, Tex.

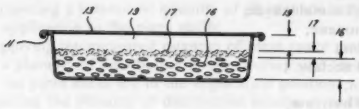
Filed July 1, 1974, Ser. No. 485,025

Int. Cl.² B65D *85/70*

U.S. Cl. 426—618 **8 Claims**

1. A package of seasoned rice mix adapted for storage at ambient temperatures comprising an impervious container; a hygroscopic seasoning mix containing hydrolyzed vegetable protein in an amount between about 20% and about 50% by

weight of said hygroscopic seasoning mix; a dry precooked rice, said precooked rice having a moisture content as disposed in the container below about 5%; said dry precooked rice being from about 50% to about 95% of the rice mix net



weight and said hygroscopic seasoning mix ranging from about 5% to about 25% of the rice mix net weight; and means hermetically sealing said container with said rice and seasoning mix therein to prevent the entry of moisture into said container.

3,982,042

FROZEN CONFECTIONS MADE WITH STABILIZED COCOA-FLAVORED SYRUPS

Sidney Arden, Forest Hills, N.Y., assignor to Consolidated Foods Corporation, Englewood, N.J.

Division of Ser. No. 134,049, April 14, 1971, Pat. No. 3,821,420. This application Nov. 12, 1973, Ser. No. 415,093
The portion of the term of this patent subsequent to June 28, 1991, has been disclaimed.
Int. Cl.[2] A23G *1/00, 3/00*
U.S. Cl. 426—631 **6 Claims**

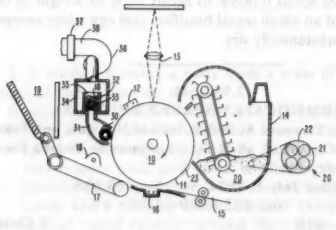
1. A quiescently frozen chocolate-flavored confection produced by the steps comprising providing a non-acid confection mix including sweetener, vegetable gum and water; adding to said mix at ambient temperature under agitation a stabilized cocoa-flavored syrup solution having a high cocoa content, said syrup comprising from about 18 to 25 weight percent cocoa, from about 35 to 45 weight percent of a sweetener, the equivalent of about 0.1 to 0.6 weight percent of an amylolytic enzyme having an activity of 4.4 mgs. alpha amylase per mg. starch, and sufficient water to produce a solution having between 58 and 65 weight percent solids, said weight percents being based on the total weight of the solution, and said cocoa comprising sufficient Dutch process cocoa to maintain a solution pH of about 5.5 to 7.5; pouring the resulting mixture into molds; and freezing the mixture.

3,982,043

TRIBOELECTRIC FILTER AND METHOD OF USING IT IN AN ELECTROPHOTOGRAPHIC PRINTER

Henry Wellington Simpson, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 426,750, Dec. 20, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,888
Int. Cl.[2] B05D *1/06;* **G03G** *21/00*
U.S. Cl. 427—14 **4 Claims**



1. In the method of producing successive printed images wherein a physical image is produced by: conveying a development mixture of relatively large carrier particles and relatively small toner particles into operative engagement with an imaging surface bearing a differential electrostatic charge image, at least the external surfaces of said carrier particles and said toner particles being of materials having a substantial triboelectric charge development characteristic therebetween and at least one of said materials being a dielectric; transferring a substantial part of said physical image to a support surface; and mechanically dislodging toner particles that remain on said imaging surface following said transfer step and entraining said dislodged toner particles in a gaseous medium to form a mixture thereof, the improvement comprising:

collecting said entrained toner particles from said mixture by passing said mixture through a body of carrier particles that are substantially identical to the carrier particles of said development mixture whereby the toner particles adhere to the body of carrier particles, and

mixing at least a portion of said body of carrier particles bearing collected toner particles into at least a portion of said development mixture.

3,982,044

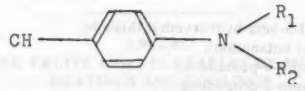
SILVER HALIDE PHOTOGRAPHIC EMULSIONS USED FOR ELECTRON BEAM RECORDING

Junichi Matsuyama; Yoshiyuki Nakazawa; Yasuharu Nakamura; Reiichi Ohi, all of Minami-ashigara, Odawara, Japan, and Tokiharu Kondo, deceased, late of Minami-ashigara, Japan, by Yoshiharu Kondo, legal representative, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 455,089, March 27, 1974, abandoned, which is a continuation-in-part of Ser. No. 206,903, Dec. 10, 1971, abandoned. This application July 3, 1975, Ser. No. 593,337
Claims priority, application Japan, Dec. 10, 1970, 45-109871
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—43 **15 Claims**

1. In a process for recording electron beams which comprises imagewise exposing to electron beams a photographic fine grain silver halide emulsion containing fine silver halide grains having a mean grain size by diameter no greater than 0.2 micron and processing said silver halide emulsion, the improvement wherein said photographic fine grain silver halide emulsion contains at least one compound represented by the following formula;

$$A - N = (CH - CH=)_n$$



wherein A represents an aliphatic group, an aryl group, or a 5- or 6-membered heterocyclic ring containing at least one nitrogen atom selected from the group consisting of a morpholine nucleus, a piperidine nucleus, a 2-thio-4-oxo-thiazolidine nucleus, a thiadiazole nucleus and a 1,3,4-triazole nucleus, R_1 and 2 represent a hydrogen atom or a lower alkyl group, and n represents 0 or 1; said at least one compound being present in an amount sufficient to sensitize said emulsion to electron beams.

3,982,045

METHOD OF MANUFACTURE OF ADDITIVE PRINTED CIRCUITBOARDS USING PERMANENT RESIST MASK

Peter E. Kukanskis, Watertown, Conn., assignor to MacDermid Incorporated, Waterbury, Conn.

Filed Oct. 11, 1974, Ser. No. 513,994
Int. Cl.² C23C 3/02
U.S. Cl. 427—98 6 Claims

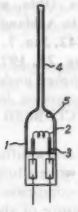
1. In the plating of a non-conductive substrate by an all-additive electroless plating process wherein the process includes the usual steps in sequence of treating the substrate surface with a precious metal catalyst solution to produce sites catalytic to the reduction thereon of a metal from an electroless metal plating solution, applying a permanently retained resist mask to portions of the catalytically activated surface to define a desired pattern resistive to deposition of electroless metal, accelerating the substrate surface by treatment in a dilute acid or alkali solution to reactivate the unmasked catalyzed areas, and then electrolessly plating the substrate in a reducing solution of the metal to be plated to provide the total desired thickness of metal deposit on the substrate, the improvement in such process which comprises: subjecting the substrate to another accelerating step in dilute acid or alkali solution subsequent to catalyzation but prior to application of the permanent resist mask, whereby to increase the surface resistivity between plated areas of the substrate and improve the plated metal adhesion.

3,982,046

INCANDESCENT LAMPS

David Robert Mason; Susan Margaret Cole, both of Runcorn; John Michael Rees, and James Richard Coaton, both of London, all of England, assignors to Thorn Lighting Limited, London, England

Division of Ser. No. 434,381, Jan. 18, 1974, Pat. No. 3,902,091. This application Apr. 3, 1975, Ser. No. 564,768
Claims priority, application United Kingdom, Jan. 19, 1973, 2952/73
Int. Cl.² H01K 1/32
U.S. Cl. 427—106 7 Claims



1. In the method of making a tungsten-halogen lamp comprising a light-transmitting envelope, internal components including a tungsten filament and supports thereof sealed within said envelope and a gaseous fill including halogen in said envelope, the improvement comprising the steps of:

coating at least those portions of the internal surface of the envelope and the exposed surfaces of said internal components, which tend to react with halogen during operation of the lamp, with a solution having dissolved therein a composition selected from metal phosphates and arsenates, said solution being capable of generating on being heated a potentially vitreous compound;

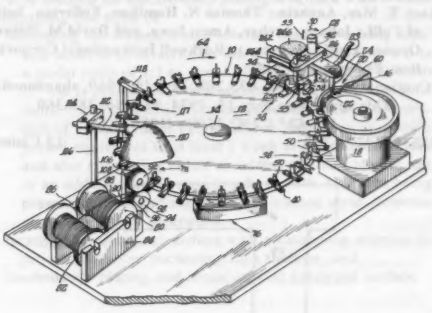
and heating said surfaces to form thereon a vitreous coating of said metal phosphate or arsenate.

3,982,047

SOLDERING METHOD

Denver Braden, San Diego, Calif., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 569,634, April 18, 1975, which is a division of Ser. No. 467,528, May 6, 1974, abandoned. This application May 22, 1975, Ser. No. 580,099
Int. Cl.² C23C 17/00
U.S. Cl. 427—123 4 Claims



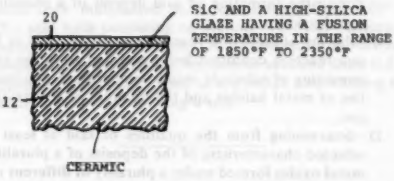
1. A method of applying solder to contact means of an electrical component having a flat contact surface comprising the steps of placing said flat contact surface of said component against an independent support member of a solder rejecting material that is not secured to said component, while leaving the remaining portion of said contact means exposed, and applying a predetermined amount of melted solder over the exposed portion of said contact means while simultaneously forcing said flat contact surface of said component against said independent support member with a force sufficient to prevent any substantial amount of solder from flowing between said flat contact surface of said component and said support member so that said entire contact means is covered with solder except for said flat contact surface.

3,982,048

METHOD OF MAKING AN INSULATOR WITH A NON-LINEAR RESISTIVITY COATING OF GLASS BONDED SILICON CARBIDE

John E. Zlupko, Philadelphia, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Nov. 3, 1975, Ser. No. 628,033
Int. Cl.² B05D 5/12
U.S. Cl. 427—126 6 Claims



1. A method of making an electrical insulator comprising:

a. providing a ceramic body,

b. providing a non-linear resistivity coating material comprising particles of silicon carbide having a particle size of 400–650 mesh and a binder for said particles comprising a glass or a glass-forming material having a fusion temperature in the range of 1850° F to 2350° F, said silicon carbide particles being present in said coating material in a percentage of 10 to 30 percent by weight of said coating material,

c. applying said coating material to said ceramic body to form a thin coating thereon,

d. firing said coated ceramic body at a temperature in the range of 1850° F to 2350° F in an inert gaseous atmosphere to form on said ceramic body a glaze coating that has non-linear resistivity properties.

3,982,049

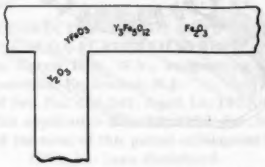
METHOD FOR PRODUCING SINGLE CRYSTAL FILMS

Jack E. Mee, Anaheim; Thomas N. Hamilton, Fullerton, both of Calif.; John L. Archer, Ames, Iowa, and David M. Heinz, Orange, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 833,268, June 16, 1969, abandoned. This application July 15, 1974, Ser. No. 488,360

Int. Cl.² C23C *11/08;* **H01F** *1/34*

U.S. Cl. 427—128 **13 Claims**



1. A method of optimizing the deposition of a deposit of a desired complex metal oxide, with respect to at least one selected characteristic of the deposit of said desired complex metal oxide, said at least one selected characteristic being selected from the group consisting of, location of the zone where said desired complex metal oxide deposits, size of the zone where said desired complex metal oxide deposits, rate of deposition of said desired complex metal oxide and purity of said desired complex metal oxide deposit, said method comprising:

performing steps A and B a plurality of times and performing step C prior to at least one repetition of step A;

A. reacting metal halides with an oxidizing gas in a reaction chamber to form a deposit of a plurality of metal oxides at different locations on a substrate means, said metal oxides including said desired complex metal oxide, said oxidizing gas consisting of at least one gas selected from the group consisting of water vapor and O_2;

B. determining from said deposit of a plurality of metal oxides the quality of said at least one selected characteristic of said desired complex metal oxide deposit which is obtained under the reaction conditions extant during the formation of said deposit of a plurality of metal oxides;

C. altering at least one reaction condition, said at least one reaction condition being selected from the group consisting of substrate means temperature, the quantities of metal halides and the quantity of the oxidizing gas;

D. determining from the qualities of said at least one selected characteristic of the deposits of a plurality of metal oxides formed under a plurality of different reaction conditions, the reaction conditions which yield a deposit of said desired complex metal oxide which is optimized with respect to at least one selected characteristic.

8. The method recited in claim 1 wherein said desired complex metal oxide is a garnet and the selected characteristic is the size of the zone in which said garnet is deposited.

9. The method recited in claim 1 wherein the desired complex metal oxide is an orthoferrite and the selected characteristic is the size of the zone in which said orthoferrite is deposited.

3,982,050

METHOD FOR COATING INNER FACES OF METAL PIPES OF SMALL DIAMETER

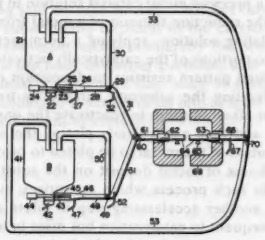
Haruhiro Kato, Kawasaki; Tsunehiko Toyoda, and Hiroyuki Tanabe, both of Yokohama, all of Japan, assignors to Dai Nippon Co., Ltd., Japan

Filed May 16, 1974, Ser. No. 470,670

Claims priority, application Japan, May 21, 1973, 48-56631

Int. Cl.² B05D *7/22, 1/24*

U.S. Cl. 427—181 **4 Claims**



1. A method for coating the inner faces of small diameter metal pipes which comprises feeding under pressure a stream of an air or inert gas-diluted powdery mixture composed of 20 to 90 parts by weight of a powdery resin having an average particle size of 5 to 100μ and 80 to 10 parts by weight of a carrier having a melting point at least as high as the melting point of said powdery resin and having an average particle size of 150μ to 5 mm and from 5 to 100 times greater than the average particle size of the powdery resin, said carrier forming substantially no part of said coating, through the interior of the metal pipe preheated to a temperature 20° to 70°C higher than the melting point of said powdery resin, at a rate of from 2 to 10 m/sec, so that the powdery mixture concentration is 5 to 40% by volume throughout the coating operation.

3,982,051

BACKSIZING CARPET WITH HOT MELT COMPOSITION OF ETHYLENE COPOLYMER, ATACTIC POLYPROPYLENE AND VULCANIZED RUBBER

David D. Taft, Columbus, Ohio, and Terry H. Shepler, St. Paul, Minn., assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 216,242, Jan. 7, 1972, Pat. No. 3,849,353. This application Aug. 28, 1974, Ser. No. 501,415

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² B05D *5/10*

U.S. Cl. 427—207 **15 Claims**

1. A process for backsizing a tufted carpet having a primary textile backing and non-woven tufts of synthetic fibers protruding therefrom which comprises:

a. heating to a temperature of about 160°F to 375°F, a hot melt coating composition, said hot melt composition consisting essentially of:

1. copolymer of ethylene and unsaturated ester monomer selected from the group consisting of vinyl acetate; alkyl acrylate wherein the alkyl group contains 1-18 carbon atoms; and mixtures thereof; containing from about 40 to 85% by weight of ethylene and from about 15 to about 60% by weight of unsaturated ester monomer;

2. atactic polypropylene; and

3. vulcanized rubber; said composition based upon the combined weight of (1), (2), and (3) containing from about 5% to about 50% by weight of (1); about 10 to about 85% by weight of (2) and about 10 to about 50% of (3);

b. applying a uniform coating in an amount from about 10 to 40 ounces per square yard of said composition in a

molten state to the backside of said carpet at a coating station while moving said carpet past said station at a speed of from about 20 to 60 feet per minute; and

c. thereafter solidifying said carpet by cooling it below its melting point.

3,982,052

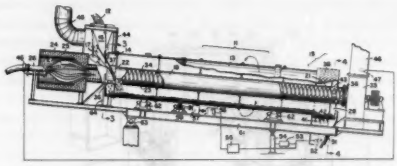
METHOD OF TREATING WET COAL GRANULES

Wendell E. Bearce, Box 241, St. Clairsville, Ohio 43950

Filed Jan. 27, 1975, Ser. No. 544,107

Int. Cl.² C10L 5/04, 5/24

U.S. Cl. 427—212 6 Claims



1. The method of treating wet coal granules, comprising passing said wet coal granules through a dryer in the form of a heated cylindrical drum rotated about its axis while heated steel balls are moved through said wet granules and introducing a liquid petroleum derivative, which is essentially non-volatile at the boiling point of water, into said dryer so as to effect simultaneous drying of the coal granules and uniform coating of their surfaces with said liquid petroleum derivative so as to obtain a relatively dry, oil-like coating on said granules which is dust free.

3,982,053

PROCESS FOR FLAMEPROOFING ORGANIC FIBER MATERIAL BY THE TRANSFER PROCESS

Fritz Mayer, Haltingen, Germany; Jörg Kern, Oberwil, and Hermann Nachbur, Dornach, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

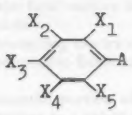
Filed June 18, 1974, Ser. No. 480,336

Claims priority, application Switzerland, June 22, 1973, 9187/73; July 26, 1973, 10929/73

Int. Cl.² C23C 11/00; C09K 3/28

U.S. Cl. 427—248 12 Claims

1. Process for flameproofing organic fiber material by the dry thermal transfer process which comprises applying to an inert carrier a preparation comprising a halogen compound of the formula



wherein A is halogen, hydroxyl, alkoxycarbonyl with 2 to 5 carbon atoms, halogenoalkoxy with 1 to 4 carbon atoms or halogenophenyl and X_1, X_2, X_3, X_4 and X_5 are each halogen, alkyl with 1 to 4 carbon atoms, hydroxyl or hydrogen, but at most one of the radicals X_1, X_2, X_3, X_4 and X_5 is alkyl or hydroxyl and at least one of the radicals is halogen, and X_1 and A can together be a radical of the formula —CO—O—CO—, bringing the carrier into contact with the surface of the fiber material which is to be flameproofed, thereafter subjecting the carrier and the material to be finished to a heat treatment at 150° to 220°C, until the halogen compound has been transferred to the fiber material, and then separating the finished material from the carrier.

3,982,054

METHOD FOR ELECTROLESSLY DEPOSITING METALS USING IMPROVED SENSITIZER COMPOSITION

Nathan Feldstein, Kendall Park, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 226,294, Feb. 14, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,155

Int. Cl.² C23C 3/02

U.S. Cl. 427—299 7 Claims

1. A method for electrolessly plating a surface with a metal comprising the steps of:

sensitizing the surface with a solution made by mixing separate sources of divalent tin ion and tetravalent tin ion in a molar ratio of 1:1 to about 1000:1, where said divalent tin ion is present in a concentration of up to about 0.26 molar, said tetravalent tin ion is present in a concentration of up to about 0.125 molar, and has been aged for a period equivalent to at least 1 week at room temperature and also containing either an added soluble chloride salt or an added soluble bromide salt, or both, said salts being present in a concentration, in the ionized state, between about 0.5 M and saturation,

treating the sensitized surface with a catalyzing solution to provide catalytic nucleating sites thereon, and

electrolessly plating said metal on said catalyzed surface.

3,982,055

METHOD FOR ZINCATING ALUMINUM ARTICLES

Addison M. Howard, Exton, Pa., assignor to Eltra Corporation, Toledo, Ohio

Filed July 25, 1974, Ser. No. 491,700

Int. Cl.² C23C 3/00

U.S. Cl. 427—309 2 Claims

1. A method for preparing an aluminum-containing body having substantially grease-free surfaces to receive an electrically deposited surface coating, which method includes the steps of etch cleaning and zinc-coating the body by immersion thereof for from 5 to 10 seconds in an aqueous sodium hydroxide bath ranging in normality from 1.3 to 2.7, and maintained at a temperature from 170° to 190°F., said bath also containing from 1-¼ to 3 percent of the tetrasodium salt of ethylenediamine tetraacetic acid and from 0.05 to 0.15 percent of zinc oxide, washing the etch cleaned and zinc-coated body, drying the washed body by removing wash water therefrom, etching the dried body in 40° Be nitric acid at a temperature not higher than about 110°F. for from 2 to 5 seconds, with the proviso that, when the body is an alloy containing as much as 2 percent of silicon, the nitric acid also contains from 1-½ to 3 percent of ammonium bifluoride, washing the etched body in cold running water, zincating the washed body by immersion thereof for from ½ second to 5 seconds in an aqueous bath maintained at a temperature from 120° to 160°F., said bath consisting of sodium hydroxide ranging in normality from 2-½ to 5, from 5 to 18 percent of the tetrasodium salt of ethylenediamine tetraacetic acid and from 0.4 to 2.5 percent of zinc, calculated as the metal, and washing the zincated body in cold running water.

3,982,056

METHOD FOR IMPROVING THE PRINTABILITY CHARACTERISTICS OF GLOSS CALENDERED PAPER

Charles Delbert Holder, Jr., Mobile, Ala., assignor to International Paper Company, New York, N.Y.

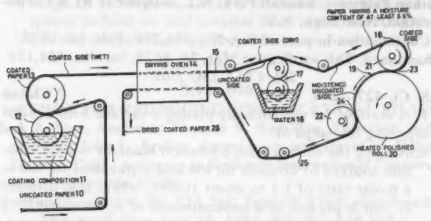
Filed Oct. 15, 1974, Ser. No. 514,739

Int. Cl.² B05D 3/12

U.S. Cl. 427—361 17 Claims

1. A process for treating paper coated on one side, which comprises: applying a liquid only to the uncoated side in an amount sufficient to provide a moisture content of about 8.5

to 20% by weight in the paper; and then, gloss calendering the moistened paper with the unmoistened side of the paper



pressed against the polished roll of the gloss calender, without moistening the polished roll of the gloss calender.

3,982,057

PAPER HONEYCOMB CUSHIONING PAD

William R. Briggs, Bowie, Md., and Eugene A. Ripperger, Austin, Tex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

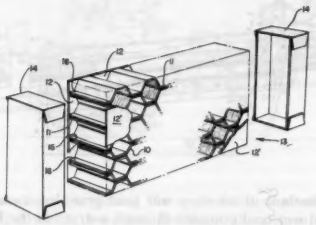
Filed June 21, 1974, Ser. No. 481,737

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.[2] B32B 3/12

U.S. Cl. 428—73 **3 Claims**

1. In a double faced expanded paper honeycomb cushioning pad adapted for preventing blowouts through the ends of said double faced expanded paper honeycomb cushioning pad upon impact, said double faced expanded paper honeycomb cushioning pad comprising a plurality of sheets of Kraft paper adhered together along parallel spaced apart glue lines, expanded to form air cells hexagonally shaped in cross section and bounded by portions of said sheets of Kraft paper, and double faced by facing sheets of Kraft paper adhered over the top and bottom of the expanded paper honeycomb cushioning pad, thereby forming in said double faced expanded paper honeycomb cushioning pad a plurality of adjacent closed air cells hexagonally shaped in cross section, said double faced expanded paper honeycomb cushioning pad having a pair of ends each comprising a row of vertically sliced air cells, the glue lines of said vertically sliced air cells being normal to said ends, the improvement which comprises means for preventing blowouts through said ends of said double faced expanded paper honeycomb cushioning pad, said blowout preventing means comprising two end caps, each of said two end caps being adhered to the exterior surfaces of said double faced



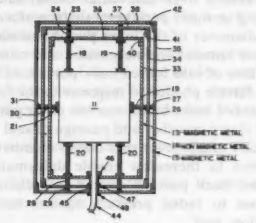
expanded paper honeycomb cushioning pad adjacent to one of said two ends so as to close and seal each of said two ends, said end caps being constructed of 70 to 80 lb. Kraft paper tape, said Kraft paper tape being folded over said facing sheets and over the side surfaces of said double faced expanded paper honeycomb cushioning pad to a sufficient extent and adhered sufficiently tightly to said facing sheets and said side surfaces to prevent a blowout from occurring through either of said two ends of said double faced expanded paper honeycomb cushioning pad upon impact.

ELECTRICAL

3,982,058
MAGNETIC AND ELECTRIC FIELD SHIELDING OF COMPUTER COMPONENTS FROM LIGHTNING

Robert D. Hill, Santa Barbara, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 13, 1975, Ser. No. 577,365
Int. Cl.[2] H05K *9/00*
U.S. Cl. 174—2 5 Claims



1. A shield system surrounding electrical components for protecting them from changes in magnetic and electric fields caused by lightning comprising:

at least three walls of metal surrounding said components,

said walls forming a plurality of containers which have a total shielding efficiency on the order of 10^6,

the outer and inner of said walls being made of magnetic metal for providing shielding from magnetic field disturbances of cloud-to-ground electric lightning strokes,

the walls intermediate said outer and inner walls made of a highly conductive non-magnetic metal for providing shielding from electric field disturbances of cloud-to-ground electric lightning strokes,

said walls being spaced apart from one another,

said containers being held spaced apart by dielectric material cemented to the containers; and

a conduit extending through said containers and leads and cables entering and leaving said containers through said conduit;

said conduit formed by continuous metal surfaces and said cables and leads having a flexible metallic covering which terminates at the conduit,

said conduit positioned to enter and leave the bottom ends of said containers in view of preponderantly horizontal magnetic field vectors that propagate from said lightning strokes.

5. A method of protecting electrical devices from changes in magnetic and electrostatic fields caused by lightning comprising:

entrapping a substantial portion of the magnetic field by enclosing the devices in a shield of magnetic metal symmetrically deployed a selected distance from the devices;

cancelling the electrostatic field by enclosing the devices in a shield of non-magnetizable metal symmetrically deployed within and spaced from said magnetic field entrapping shield;

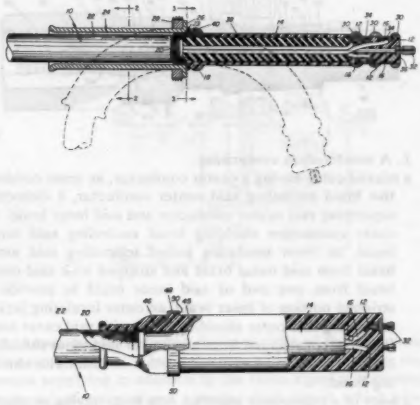
entrapping and cancelling any remaining magnetic fields by enclosing the devices in a shield of magnetic metal symmetrically deployed within and in close proximity of said electrostatic field cancelling shield; and

forming a passage through said shields for accommodating cables and leads by installing a tubular member through said shields, the walls of said tubular member being made of the same material as the shield for cancelling said electrostatic field.

3,982,059
FLEXIBLE CABLE TERMINATION

William P. Holland, West Redding, and William H. Merritt, Canton, both of Conn., assignors to The Machlett Laboratories, Incorporated, Stamford, Conn.

Continuation of Ser. No. 536,668, Dec. 26, 1974, abandoned.
This application Oct. 17, 1975, Ser. No. 623,294
Int. Cl.[2] H02G *15/02*; H01R *11/02, 21/22*
U.S. Cl. 174—73 R 2 Claims



1. A bendable terminal for an electrical cable adapted to be inserted into a hollow receptacle, said terminal including a plurality of insulated conductors, a casing of flexible insulating material over the conductors, a metallic grounding sheath over the casing, and a flexible insulating layer over the grounding sheath, comprising an extended end portion of the cable wherein the casing has a portion extending substantially beyond the ends of the grounding sheath and insulating layer, the ends of said conductors extending beyond the end of the casing, a bendable shield of self-supporting insulating material covering said extended portion of the casing, said shield being completely flexible throughout its thickness, a corona shield encircling the casing and having one end electrically connected to the end of the grounding sheath, and a tubular metal grounding member encircling the cable and having one end electrically connected to said corona shield and having its major portion extending over the cable in a direction away from said extended portion of the casing.

2. A bendable terminal for an electrical cable adapted to be inserted into a hollow receptacle, said terminal including at least one insulated conductor, a casing of flexible insulating material over the conductor, a metallic grounding sheath over the casing, and a flexible insulating layer over the grounding sheath, comprising an extended portion of the cable wherein the casing has a portion extending substantially beyond the ends of the grounding sheath and insulating layer, the end of said conductor extending beyond the end of the casing, a bendable shield of self-supporting insulating material covering said extended portion of the casing, said shield being completely flexible throughout its thickness, and an annular corona shield encircling the casing and projecting outwardly through the bendable shield and having ends of different diameters, the smaller end being connected to the grounding sheath beneath the bendable shield and the larger end overlying a circumferential portion of the outer surface of the bendable shield.

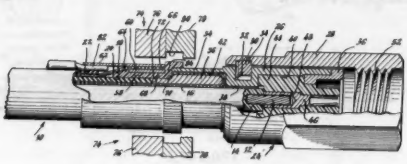
3,982,060
TRIAXIAL CABLE TERMINATION AND CONNECTOR SUBASSEMBLY

Roger P. Avery, Bethel, and Pasquale R. Petti, Waterbury, both of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 367,757, June 7, 1973, abandoned. This application Feb. 20, 1975, Ser. No. 551,446

Int. Cl.² H01R *21/00, 17/04*

U.S. Cl. 174—75 C **13 Claims**



1. A combination comprising:

a triaxial cable having a center conductor, an inner conductive braid encircling said center conductor, a dielectric separating said center conductor and said inner braid, an outer conductive shielding braid encircling said inner braid, an inner insulating jacket separating said inner braid from said outer braid and stripped with said outer braid from one end of said inner braid to provide a stripped portion of inner braid, an outer insulating jacket encircling said outer shielding braid with said outer insulating jacket stripped from one end of said outer shielding braid to provide an exposed portion of said outer shielding braid;

a body of a conductive material, said body having an axially extending thin-walled rear ferrule portion overlapping the stripped portion of said inner braid;

a conductive clamp, at least a forward portion of said clamp being positioned in said rear ferrule portion with said clamp overlappingly engaged with the stripped portion of said inner braid and having the stripped portion of said inner braid wrapped around said forward portion to fit the stripped portion of said inner braid tightly between said clamp and said rear ferrule portion;

a crimp ferrule fitted over said outer jacket and the exposed portion of said outer braid;

an insulating bushing fitted between said inner jacket and said outer braid, said bushing being shaped and positioned to physically and electrically isolate said inner braid, clamp and body from said outer braid and crimp ferrule;

a metallic bushing positioned between said insulating bushing and said outer braid;

a first crimp formed in said crimp ferrule to secure said outer braid between said metallic bushing and said crimp ferrule; and

a second crimp formed in said rear ferrule portion and spaced axially from said first crimp to secure said rear ferrule portion to said conductive clamp and inner braid.

4. A subassembly adapted to secure a connector rear annular ferrule portion to a triaxial cable including a radially expandible outer annular conductive braid and a coaxial annular inner conductive braid separated from said outer braid by an inner insulating coaxial annular jacket located between said inner braid and said outer braid with one end of said inner braid extending axially beyond one end of said jacket and outer braid and expandible to form a folded back portion spaced radially outwardly of said inner braid one end with said folded back portion having a diameter less than the diameter of the inner periphery of said annular ferrule portion for passage with said inner braid one end into said annular ferrule portion, said subassembly comprising:

an axially extending insulating annular bushing having a tapered outer peripheral surface portion adjacent one end of said bushing tapering radially inwardly toward said bushing one end, said bushing having an outer peripheral surface portion of constant diameter less than the diameter of the expanded outer braid and an inner peripheral surface with a diameter larger than the diameter of the outer peripheral surface of said inner jacket to overlappingly engage said insulating bushing over said inner jacket in response to the axial movement of said bushing over said jacket;

a conductive annular clamp member having an inner peripheral surface of a diameter larger than the one end of said inner braid and less than the outer diameter of the peripheral surface of said inner jacket to prevent passage of said clamp member over said one end of said inner jacket in response to the movement of said clamp member axially over said inner braid, said clamp member having an outer peripheral surface of a diameter less than the diameter of the inner peripheral surface of said connector annular ferrule portion and controlling the radial position of said folded back portion of the inner braid in said ferrule portion in response to the folding back of said expanded inner braid over the outer peripheral surface of said clamp member and passage of said connector ferrule portion axially over said clamp member and folded back portion to thereafter enable deformation of said inner folded back portion against said clamp member in response to radial pressure against said annular ferrule portion; and

means on said clamp member and on said bushing securing said conductive clamp member coaxially to said insulating bushing with said bushing and clamp member extending axially away from each other and said tapered outer surface portion adjacent said bushing one end spaced from said clamp member to enable the installation of said bushing one end and surface of constant diameter between said inner jacket and expanded outer braid in response to the simultaneous axial movement of said bushing and clamp member over said inner jacket and inner braid, respectively, to thereafter enable deformation of said outer braid against said bushing in response to radial pressure against said expanded outer braid;

said clamp member and said bushing each having a wall thickness and formed of a respective material avoiding deformation in response to radial pressure of sufficient magnitude against said ferrule portion and expanded outer braid, respectively, to deform said ferrule portion and said inner and outer braids.

3,982,061
DATA TRANSFER CONTROL APPARATUS

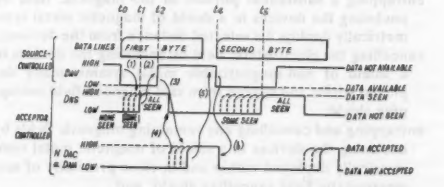
Howard Anthony Dorey, Godalming, and Robert John Cooke, Farnborough, both of England, assignors to The Solartron Electronic Group Limited, Farnborough, England

Filed Apr. 23, 1975, Ser. No. 570,688

Claims priority, application United Kingdom, May 1, 1974, 19155/74

Int. Cl.² H04Q *5/00*

U.S. Cl. 178—2 R **5 Claims**



1. A bit-parallel, byte-serial data transmission system comprising a data highway and first, second and third handshake lines, a plurality of more than two devices and a corresponding

plurality of interfaces linking said devices to said data highway and to said handshake lines, said devices including at least one data source device and more than one data acceptor device, said interfaces including logic means operable to control the exchange of data between a source device and a plurality of acceptor devices, the first line carrying a two-level signal determined by said logic means of the interface of the source device and indicating whether or not validly acceptable data is available, the second line carrying a two-level signal determined by said logic means of the interfaces of the acceptor devices and indicating whether all or not all acceptor devices have seen data, the third line carrying a two-level signal determined by said logic means of the interfaces of the acceptor devices and indicating whether all or not all acceptor devices have accepted a byte of data, and wherein said logic means of the interfaces are constructed and arranged to establish the following handshake cycle of operations (1) to (6):

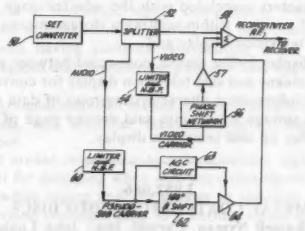
1. First line to data available level;
2. Second line to level for data seen by all acceptor devices;
3. Signal from interface of the source device commanding the interfaces of the acceptor devices to accept data;
4. Interfaces of acceptor devices accept data in response to (3);
5. Third line to level for data byte accepted by all acceptor devices;
6. Change data byte and re-set first line to data available level to recommence the cycle.

3,982,062

VIDEO ENCRIPTION SYSTEM

Kenneth Simons, Huntington Valley, Pa., assignor to Jerrold Electronics Corporation, Horsham, Pa.

Filed July 26, 1973, Ser. No. 382,820
Int. Cl.² H04N 1/44
U.S. Cl. 178—5.1 **14 Claims**



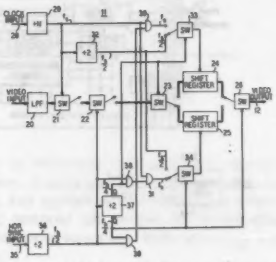
1. In combination in video program encription apparatus for encripting the transmisson of a video program signal comprising video information amplitude modulating a video carrier and sound information frequency modulating in audio subcarrier, means for producing the video carrier without concomitant modulation products, means for phase shifting the video carrier, and means for linearly combining the amplitude modulated video carrier with said phase shifted video carrier for producing a resultant combination of said modulation products and a video carrier differing in phase from the original video carrier's phase, and receiver means for receiving said signal produced by said encription apparatus for reconstituting said phase shifted carrier to its original relative phase for permitting reception of said video program.

3,982,063

METHODS AND APPARATUS FOR REDUCING THE BANDWIDTH OF A VIDEO SIGNAL

Earl Franklin Brown, Piscataway; Robert Lewis Ellenberger, Colts Neck; Alan Mayer Gordon; Pat Le Mar Gordon, both of Matawan, and John Ormond Limb, New Shrewsbury, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 3, 1975, Ser. No. 546,426
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.² H04N 5/46, 7/18
U.S. Cl. 178—6 **9 Claims**



1. Apparatus for reducing the bandwidth of the composite video signal generated by a television camera, or the like, said camera supplying in addition to the video signal a horizontal synchronization signal and a master clock signal, which comprises:

a first divider circuit for dividing the frequency of said horizontal synchronization signal by a factor of two;

a second divider circuit, connected to the output of said first divider circuit, for dividing the frequency thereof by a factor of two, said second divider circuit having first and second complementary outputs;

a third divider circuit for dividing the frequency of said master clock signal by a factor of N, where N is inversely proportional to the horizontal definition desired for the reduced bandwidth video signal;

a fourth divider circuit for dividing the frequency of the output from said third divider circuit by a factor of two;

first switching means, controlled by the output of said first divider circuit, for interrupting the transmission path of said video signal during alternate scanning lines in each field of said vido signal;

a first shift register of a capacity sufficient to store at least one complete scanning line of said video signal;

a second switching means, controlled by the first output of said second divider circuit, for alternately connecting the clock pulse input of said first shift register to the output of said third divider circuit or to the output of said fourth divider circuit;

a second shift register of a capacity sufficient to store at least one complete scanning line of said video signal;

third switching means, controlled by the second output of said second divider circuit for alternately connecting the clock pulse input of said second shift register to the output of said fourth divider circuit or to the output of said third divider circuit;

fourth switching means, connected to the output of said first switching means and controlled by the first output of said second divider circuit, for alternately routing the scanning lines of said video signal which are passed by said first switching means to said first or to said second shift register; and

fifth switching means controlled by the second output of said divider stage, for alternately selecting the output of

said first and said second shift registers thereby to generate a composite video signal of reduced bandwidth.

3,982,064

COMBINED TELEVISION/DATA TRANSMISSION SYSTEM

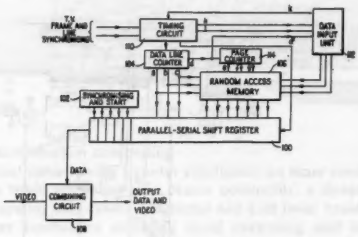
Bernard Sydney Barnaby, Ware, England, assignor to The General Electric Company Limited, London, England

Filed Sept. 5, 1974, Ser. No. 503,376

Claims priority, application United Kingdom, Sept. 4, 1973, 41445/73

Int. Cl.² H04N *7/00*

U.S. Cl. 178—5.6 **7 Claims**



1. A combined television/data transmission system for a television signal in which information characterizing a page of data to be displayed is digitally coded and transmitted in line scan periods that do not have picture information, in which each said page of data comprises a number of rows of data, each page of data being transmitted by transmitting a respective page address in a first said line scan period that does not have picture information, one or more subsequent periods of said line scan periods being utilized to transmit information relating to said rows of data, the information transmitted during each subsequent line scan period relating to a complete row of data in said respective page and containing in addition the row address in digitally coded form but not said respective page address, the end of transmission of a page of data being identified by a further one of said line scan periods in which a further page address is transmitted.

3,982,065

COMBINED TELEVISION/DATA RECEIVERS

Bernard Sydney Barnaby, Ware, and Donald Gordon Scott, London, both of England, assignors to The General Electric Company Limited, London, England

Filed Sept. 4, 1974, Ser. No. 503,172

Claims priority, application United Kingdom, Oct. 31, 1973, 50616/73

Int. Cl.² H04N *7/08*

U.S. Cl. 178—5.8 R **4 Claims**

1. Apparatus for a combined television/data receiving system of the kind responsive to a television signal

A. in which information characterizing data to be displayed in a page format comprising a number of rows of data is transmitted by a television/data signal in a television frame interval in television picture frame line scan periods that do not have picture information,

B. in which for each page in a first line scan period the page number is transmitted in digital coded form together with digital coded synchronizing pulses and other digital coded information

C. in which for each page in frame line scan periods subsequent to said first line scan period, which subsequent television frame line scan periods do not have picture information, lines of data for display in and associated with said page are sequentially transmitted

D. in which in each subsequent line scan period coded information relating to a complete row of characters is transmitted together with digital coded synchronizing pulses and coded information relating to the row address but not to said page address,

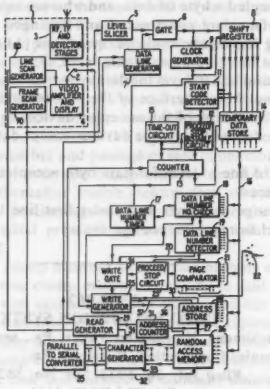
said apparatus comprising

I. selection means for selecting a desired page for display,

II. a start code detector,

III. synchronizing means for synchronizing said start code detector with the received television data signal,

IV. comparison means for comparing said transmitted page numbers with said selected desired page number and for providing an output signal when an equality is obtained,



V. main storage means connected for the reception of said information characterizing data to be displayed associated with the selected page,

VI. row address storage means operable in response to the output of said comparison means and to a received row address to store information relating to said row of characters associated with the selected page in a desired position within said main storage means,

VII. a television display and

VIII. display buffer means, connected between said storage means and said television display for conversion of said information characterizing rows of data stored in said storage means into said desired page of data for display on said television display.

3,982,066

METAL COATING FOR VIDEO DISCS

Frederick Russell Nyman, Carmel, Ind.; John Louis Vossen, Jr., Bridgewater; Dennis Glendon Fisher, Titusville, both of N.J., and George Frederick Nichols, Oaklandon, Ind., assignors to RCA Corporation, New York, N.Y.

Filed July 25, 1975, Ser. No. 599,128

Int. Cl.² B32B *15/08*

U.S. Cl. 178—6.6 R **8 Claims**

5. In a capacitive video frequency recording means in the shape of a disc having a spiral groove on a face thereof and video information in the form of geometric variations in said groove, said disc having a thin conductive layer on said face and a thin dielectric layer disposed over the conductive layer, the improvement which comprises employing as the conductive layer a trilayer film having a first layer of copper about 25 to 50 angstroms thick, a second layer of an alloy of nickel and chromium, which can contain up to 10 percent by weight of iron about 200 to about 400 angstroms thick and containing from about 20 to about 30 atomic percent of oxygen and a third layer of copper about 25 to 50 angstroms thick.

3,982,067

TELEVISION SIGNAL AMPLIFIER APPARATUS FOR COUNTERACTING EFFECTS OF UNWANTED SIGNAL COMPONENTS

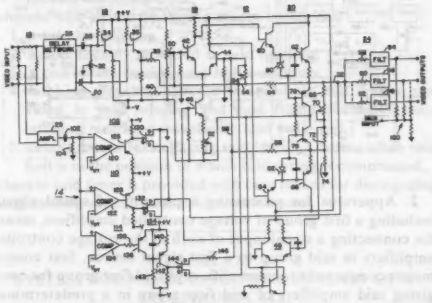
Eric R. Woods, and Russell G. Thompson, both of San Diego, Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed Nov. 1, 1974, Ser. No. 519,979

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² H04N *3/16*

U.S. Cl. 178—7.1 10 Claims



1. Television signal amplifier apparatus for counteracting the effects of unwanted signal components which can be introduced in the course of routing and processing of television signals having portions representing black and white picture regions and synchronizing signals, said apparatus comprising

a. video signal amplifier means for amplifying said television signals, said amplifier means having an input and an output,

b. first means responsive to said television signals at said input for detecting when said television signals represent the white region and are greater in absolute value than the value corresponding to a certain signal level in said white region,

c. second means responsive to said television signals at said input for detecting when said television signals represent the black region and are greater in absolute value than the value corresponding to a certain signal level in said black region,

d. third means responsive to said television signals at said input for detecting the occurrence of said synchronizing signals thereof,

e. switching means connected at said output operated by said first and second means for preventing the transmission of signals at said output when said signal levels are greater either than said certain signal level in said white region or said certain signal level in said black region, and

f. means operated by said third means for reducing the gain of said amplifier means such that said gain does not exceed unity gain during the absence of said synchronizing signals.

3,982,068

NOVEL TARGET FOR AN ULTRASONIC WAVE CAMERA AND DEVICES INCORPORATING SUCH A TARGET

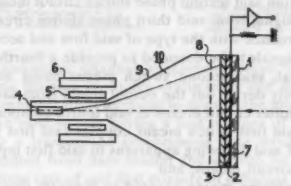
Daniel Charles; Lucien Guyot; Jean Philippe Reboul, and Guy Moiroud, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 15, 1975, Ser. No. 568,315

Claims priority, application France, Apr. 19, 1974, 74.13765

Int. Cl.² H04N *5/30*; H01J *31/49*

U.S. Cl. 178—7.2 10 Claims



1. A target for an ultrasonic camera device, characterised in that it comprises, a substrate which is exposed to incident ultrasonic waves, and applied to said substrate a retina made of a pyroelectric material and means for transforming the energy of said ultrasonic waves into thermal energy transmitted to said retina.

3,982,069

DECODING APPARATUS FOR USE IN MATRIX FOUR CHANNEL SYSTEMS OF A PLURALITY OF TYPES

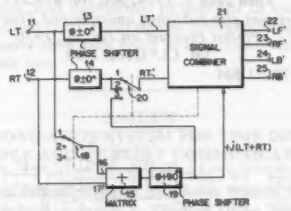
Susumu Takahashi, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Oct. 14, 1975, Ser. No. 622,173

Claims priority, application Japan, Oct. 16, 1974, 49-118898

Int. Cl.² H04R *5/00*

U.S. Cl. 179—1 GQ 6 Claims



1. A decoding apparatus for use in matrix four channel systems of different types comprising:

first and second input terminals adapted to receive first and second composite signals to be decoded respectively;

first to fourth output terminals from which first to fourth output signals are derived out;

first phase shifter circuit means coupled to said first input terminal for producing a third composite signal;

second phase shifter circuit means coupled to said second input terminal and having substantially the same phase shifting characteristic as said first phase shifter circuit means;

matrix circuit means having first and second inputs, the second input of said matrix circuit means being coupled to said second input terminal of said decoding apparatus, said matrix circuit means being operative to produce a sum of input signals when they are applied to said first and second inputs of said matrix circuit means;

first switch means coupled between said first input of said matrix circuit means and said first input terminal of said decoding apparatus for selectively coupling said first input terminal of said decoding apparatus to said first input of said matrix circuit means in accordance with the type of the first and second composite signals to be decoded;

third phase shifter circuit means coupled to the output of said matrix circuit means and having a different phase shifting characteristic from said first and second phase shifter circuit means;

second switch means for selectively deriving out an output signal from said second phase shifter circuit means and an output signal from said third phase shifter circuit means in accordance with the type of said first and second composite signals to be decoded to provide a fourth composite signal, said second switch means being adapted to selectively derive out the output signal from said second phase shifter circuit means as said fourth composite signal when said first switch means couples said first input terminal of said decoding apparatus to said first input of said matrix circuit means; and

signal combining means adapted to generate first to fourth output signals on said first to fourth output terminals respectively by combining said third and fourth composite signals, when said first input terminal of said decoding apparatus is not coupled with said first input of said matrix circuit means and generate the first and second output signals on said first and second output terminals respectively by combining said third and fourth composite signals, and the third and fourth output signals on said third and fourth output terminals respectively by combining said third and fourth composite signals and a fifth composite signal which is produced by said third phase shifter circuit means when said first input terminal of said decoding apparatus is coupled to said first input of said matrix circuit means.

3,982,070
PHASE VOCODER SPEECH SYNTHESIS SYSTEM

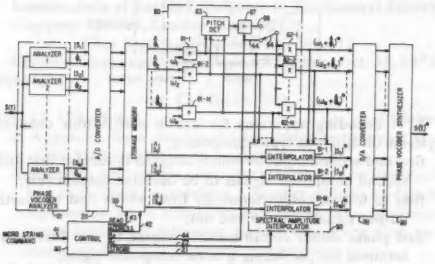
James Loton Flanagan, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 5, 1974, Ser. No. 476,577

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.[2] G10L *1/00*

U.S. Cl. 179—1 SM **15 Claims**



1. Apparatus for synthesizing a natural sounding speech message from phase vocoder stored signals representative of a vocabulary of words comprising:

means for selectively extracting preselected locations of said stored signals for constructing a predetermined sequence of signals representative of said speech message;

means for altering the pitch parameters of said extracted signals; and

means for combining said pitch modified signals.

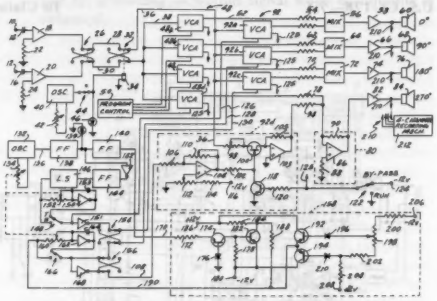
3,982,071
MULTICHANNEL SOUND SIGNAL PROCESSING SYSTEM EMPLOYING VOLTAGE CONTROLLED AMPLIFIERS

Edward A. Weiss, 322 N. Princeton Ave., Villa Park, Ill. 60181, and Harvey A. Brodsky, 9440 Lincolnwood Ave., Evanston, Ill. 60203

Filed Aug. 20, 1974, Ser. No. 499,029

Int. Cl.[2] H04R *5/00*

U.S. Cl. 179—1 GQ **20 Claims**



2. Apparatus for processing a plurality of sound signals including a first group of voltage controlled amplifiers, means for connecting a signal input of each of the voltage controlled amplifiers in said group to a first signal source, first control means connected to the amplifiers of said first group for energizing said amplifiers of said first group in a predetermined sequence, a second group of voltage controlled amplifiers, means for connecting each of the voltage controlled amplifiers in said second group to a second signal source, second control means connected to the amplifiers of the second group for energizing the amplifiers of the second group in a predetermined sequence, a plurality of mixers, each having inputs connected to the output of an amplifier of said first group and to an amplifier of said second group, said first control means comprising means for producing a plurality of a.c. control signals having the same frequency but separated in phase by equal increments, means for connecting each of said control signals individually to a voltage controlled amplifier, said second control means comprising means for providing a second plurality of a.c. control signals independent of the signals produced by said first control means, and means for connecting each of said second plurality of control signals individually to a voltage controlled amplifier of said second group.

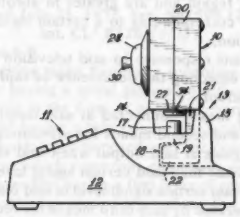
3,982,072
PHONE AID TIMING DEVICE

Jerald L. Dean, 419 E. Cass St., Albion, Mich. 49224

Filed Jan. 8, 1975, Ser. No. 539,287

Int. Cl.[2] H04M *1/21*

U.S. Cl. 179—2 TC **5 Claims**



1. An apparatus for restoring a telephone to the operable condition with regard to incoming calls after a predetermined

interval of time during which the telephone has been disabled by removal of the hand set thereof from the telephone operating switch thereby permitting the switch to close, said apparatus comprising:

a. a frame adapted to be mounted on the base of said telephone when the hand set is removed therefrom, and having means for engaging the telephone base,

b. switch operating means adapted to be placed in a first position permitting the telephone operating switch to remain in closed circuit position, and in a second position in which said switch operating means depresses said switch to open the telephone circuit, and driving means for moving said switch operating means from said first to said second position, and

c. timer means having means for actuating said driving means for causing said switch operating means to move to said second position after said predetermined time interval, whereby said telephone is once again enabled to receive incoming calls,

wherein said switch operating means comprises:

1. a tubular housing,
2. a bolt slidably mounted in said housing,
3. a coil spring biasing said bolt outwardly,
4. latching means connected to said bolt, and means provided in said housing and said frame permitting said latching means to travel with said bolt, and
5. detent means for engaging said latching means when said bolt is in the position in which said spring is compressed,

wherein said timer is provided with cam means for disengaging said latching means from said detent means.

3,982,073

SYSTEM FOR MEASURING THE DURATION OF A TELEPHONE CALL

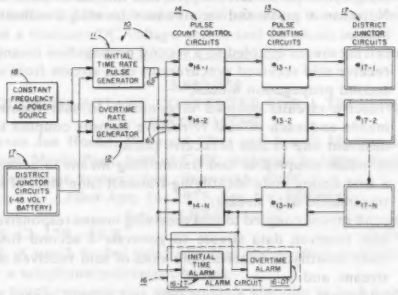
Gary L. Baltzer; Duane A. Desler, and George Pappas, all of Omaha, Nebr., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 29, 1975, Ser. No. 545,050

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² H04M *15/18*

U.S. Cl. 179—7.1 R **13 Claims**



1. A system for measuring the duration of a telephone call, which comprises:

first and second pulse generating means for generating pulses at selected frequencies representative of a call initial time rate and a call overtime rate, respectively, and

pulse counting means for counting the pulses from said first pulse generating means until a maximum initial time period for the call initial time rate is reached, and for then counting the pulses from said second pulse generating means to measure the call overtime period.

3,982,074

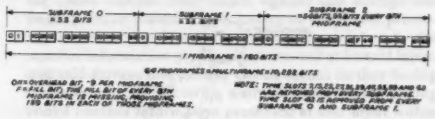
AUTOMATIC CHANNEL ASSIGNMENT CIRCUIT

James Monroe Clark, Cedar Grove, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Apr. 21, 1975, Ser. No. 570,057

Int. Cl.² H04J *3/06*

U.S. Cl. 179—15 BV **22 Claims**



1. An automatic channel assignment circuit coupled to a digital time division multiplex multiplexer and demultiplexer at one communication terminal to control the multiplexing of N transmit port signals having a first mixture of different bit rates into a transmitted synchronous data stream having a predetermined fixed data format and a given bit rate greater than the total rate of said first mixture of different bit rates and to control the demultiplexing of N receive port signals having a second mixture of different bit rates from a received synchronous data stream having said data format and said given bit rate, where N is an integer greater than one, comprising:

a first source of a first timing code identifying transmit time slots of said transmitted data stream;

a second source of a second timing code identifying receive time slots of said transmitted data streams; and

a circuit arrangement coupled to said first and second sources and to each of said multiplexer and said demultiplexer, said circuit arrangement responding to said first and second timing codes to produce at least one transmit control signal for coupling to said multiplexer and at least one receive control signal for coupling to said demultiplexer, said transmit control signal controlling the distribution of bits of each of said transmit port signals with equal spacing throughout said transmit time slots and said receive control signal controlling the extraction of bits of each of said receive port signals from said received data stream, said bits of each of said receive port signals being distributed with equal spacing throughout said receive time slots, said distribution of said bits of each of said transmit and receive port signals throughout said transmit and receive time slots being in agreement with its associated bit rate.

3,982,075

SYNCHRONIZATION SYSTEM FOR TIME DIVISION MULTIPLE ACCESS RELAY COMMUNICATIONS SYSTEM

Alan Kenneth Jefferis, Reading, and Kevin Hodson, Billericay, both of England, assignors to The Post Office, London, England

Filed Sept. 9, 1974, Ser. No. 504,349

Int. Cl.² H04J *3/06*

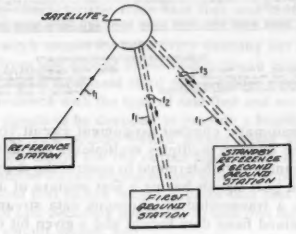
U.S. Cl. 179—15 BS **31 Claims**

1. A synchronization system for a satellite communication Time Division Multiplex Access (TDMA) relay system having a predetermined frame period within which data bursts are transmitted and including a satellite relay and a plurality of ground stations, one of which is designated a reference station, said system comprising at each ground station:

transmitter means for transmitting a carrier signal having a frequency which is characteristic of the respectively corresponding ground station thereby defining a frequency division channel characteristic of the respectively corresponding ground station,

modulation means for modulating said carrier signal with a periodic signal having a period harmonically related to said frame period but which periodic signal is separate and distinct from said data bursts,

phase comparator means at each non-reference ground station for comparing the phase relationship of its respectively corresponding periodic signal after transmission to and return from the satellite relay relative to the periodic signal transmitted from the designated reference ground station via the satellite, and



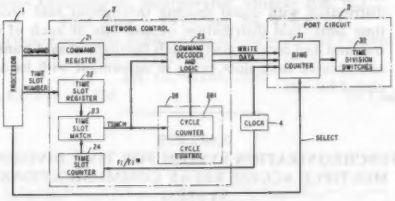
control means at said non-reference ground stations responsive to said phase relationship to align the phase relationship of the compared periodic signals to achieve synchronization of the TDMA signals at the satellite.

3,982,076

NETWORK CONTROL CIRCUIT FOR A TIME DIVISION SWITCHING SYSTEM

Donald Gifford Hill, and Theras Gordon Lewis, both of Boulder, Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N. J. 07974

Filed Dec. 23, 1974, Ser. No. 535,576
Int. Cl.² H04J *3/02*
U.S. Cl. 179—15 AT **11 Claims**



1. For use with a time division switching system capable of operating with various numbers of time slots, said system having port circuits including a ring counter having a number of stages equal to the largest number of time slots with which said system is capable of operating and circuitry for writing connection information into selected ones of said stages, and

means for engaging any one of said circuits on a telecommunications connection, the improvement comprising,

means for receiving information from said engaging means designating a particular time slot for said connection, and

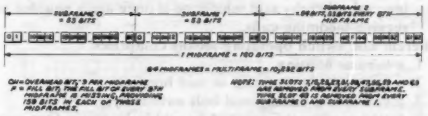
means for controlling said writing circuitry to write connection information selectively into an individual one and a predetermined plurality of said stages in said engaged one of said circuits to cause connections therefrom in said designated time slot, said predetermined plurality being equal to the number of counter stages divided by the number of time slots in said system.

3,982,077

ASYNCHRONOUS MULTIPLEXER AND DEMULTIPLEXER COMBINATION

James Monroe Clark, Cedar Grove; Stuart Barry Cohen, Nutley, and Arthur Howard Magnus, Succasunna, all of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Apr. 7, 1975, Ser. No. 565,905
Int. Cl.² H04J *3/04*
U.S. Cl. 179—15 BV **19 Claims**



1. An asynchronous digital time division multiplex multiplexer and demultiplexer combination at one communication terminal to multiplex N asynchronous data transmit ports having a first mixture of different bit rates into a transmitted synchronous data stream having a predetermined fixed data format and a given bit rate greater than the total rate of said first mixture of different bit rates and to demultiplex N asynchronous data receive ports having a second mixture of different bit reates from a received synchronous data stream having said data format and said given bit rate, where N is an integer greater than one, comprising:

transmitting means coupled to a first propagation means to transmit said transmitted synchronous data stream on said first propagation means;

N transmit circuits each coupled to a different one of said N transmit ports and in common to said transmitting means;

receiving means coupled to a second propagation means to receive said received synchronous data stream from said second propagation means;

N receive circuits coupled in common to said receiving means and each of said N receive circuits coupled to a different one of said N receive ports;

first means coupled to said transmitting means to generate a first timing code identifying transmit time slots of said transmitted data stream;

second means coupled to said receiving means responsive to said received data stream to generate a second timing code identifying receive time slots of said received data stream; and

third means coupled to said first and second means and each of said N transmit and receive circuits, said third means responding sequentially to said first and second timing codes to produce transmit and receive port timing signals to control distribution of bits of each of said transmit ports with equal spacing throughout said transmit time slots and to control extraction of bits of each of said receive ports from said received data stream, said bits of each of said receive ports being distributed with equal spacing throughout said receive time slots, said distribution of said bits of each of said transmit and receive ports throughout said transmit and receive time slots being in agreement with its associated bit rate.

3,982,078

LINE MATCHING CIRCUIT FOR USE IN A TONE PUSHBUTTON DIALLING SUBSCRIBER'S SET PROVIDED WITH A TONE GENERATOR

Daniel Johannes Gerardus Janssen, and Cornelis Maria Hart, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

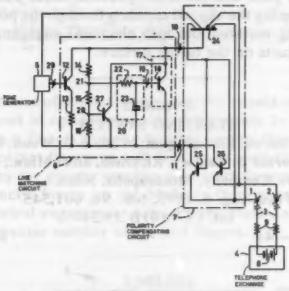
Filed May 22, 1974, Ser. No. 472,284

Claims priority, application Netherlands, May 25, 1973, 7307296

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.[2] H04M *1/50, 1/00*

U.S. Cl. 179—81 R **5 Claims**



1. Line matching circuit for matching the impedance of a tone generator in a subscriber's pushbutton dialling set with a transmission line connected thereto, comprising two terminals, means for coupling said two terminals to said transmission line, a signal controlled alternating-current source means coupling the tone generator to said two terminals for supplying alternating currents at tone signal frequencies thereto, a potentiometer connected between said terminals, a low-pass filter having its input connected to a first tap on said potentiometer and its output connected to the input of an amplifier, the output of said amplifier being connected between the terminals to control the amplitude of slowly varying DC currents flowing through said transmission line in order to maintain a constant DC voltage across said terminals.

3,982,079

TOUCH-TO-ROTARY CONVERTER FOR A TELEPHONE INSTRUMENT

Steven Jon Hoehn, Redwood City, and Joseph Monroe Jackson, Menlo Park, both of Calif., assignors to Litton Business Telephone Systems, Inc., Sunnyvale, Calif.

Filed Apr. 16, 1975, Ser. No. 568,601

Int. Cl.[2] H04M *1/272*

U.S. Cl. 179—81 R **1 Claim**

1. A touch-to-dial pulse selecting and sending combination for a telephone instrument having:

a touch type selector pad having a plurality of push buttons arranged in a plurality of rows and columns;

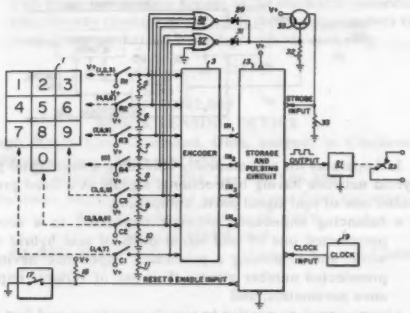
a first plurality of switches, each one of said switches being associated with a corresponding one of said rows of push buttons for operation in response to depression of any push button in said respective row;

a second plurality of switches, each one of said switches being associated with a corresponding one of said columns of push buttons for operation in response to depression of any push button in said respective column;

encoder means, having input means containing a plurality of inputs corresponding in number to the sum of said first and second plurality of switches and an output means, for converting touch signals at said input means represented by an operated one of said first plurality of said switches and an operated one of said second plurality of switches to a coded number information signal at said output means;

means coupling each of said switches in circuit with a corresponding one of said input means of said encoder means;

storage and pulsing circuit means having an input for receiving coded number information signals, said storage and pulsing circuit means further having an output for providing a series of pulses corresponding in number to the number information previously presented at its said input, and said storage and pulsing circuit means further having a strobe input for receiving a strobe signal for registering coded number information presented at said input within said storage and pulsing circuit means;



means coupling said output means of said encoder means to said input of said storage and pulsing circuit means; and

relay means, said relay means being coupled to said output of said storage and pulsing circuit means responsive to pulses therefrom for opening a contact for the duration of each pulse;

the improvement comprising in combination therewith:

strobe means responsive to the concurrent operation of at least one of said first plurality of switches and at least one of said second plurality of switches for providing a signal to said strobe input of said storage and pulsing circuit means at the end of a predetermined time interval greater than 50 nanoseconds and less than 150 milliseconds, said strobe means comprising:

first Nor gate means for providing an output in response to the operation of any one of said first plurality of row switches;

second Nor gate means for providing an output in response to the operation of any one of said second plurality of column switches; and

third Nand gate means responsive to concurrent outputs from said first gate means and said second gate means for providing an output at a predetermined interval of time thereafter to said strobe input, said third Nand gate means including:

first resistor means;

first and second diode means; and

transistor means having an emitter, base, and collector;

said first diode being connected in between the output of said first gate and said resistor and said second diode being connected in circuit between the output of said second gate and said resistor;

second resistor means;

means connecting a voltage source, said emitter, collector and said second resistor means in a series circuit;

means connecting said transistor base in circuit with said first resistor means for applying any voltage thereacross to said base;

whereby said transistor is switched between its non-conductive state in dependance upon the voltage at the base

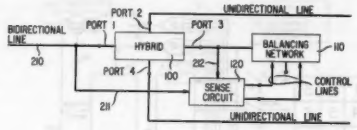
thereof being greater or less than, respectively, a predetermined level to generate said strobe input signal at said collector.

3,982,080

AUTOMATIC CABLE BALANCING NETWORK

Richard Larry Ukeiley, Englishtown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 16, 1975, Ser. No. 541,415
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl.[2] H04B *1/52*
U.S. Cl. 179—170 D 10 Claims



1. Apparatus for automatically balancing a four signal port hybrid network having bidirectional signals at a fixed preselected one of said signal ports, comprising:

a balancing impedance network connected to a second preselected one of said signal ports of said hybrid network, and exhibiting a prechosen impedance having a preselected number greater than one of variable impedance parameters; and

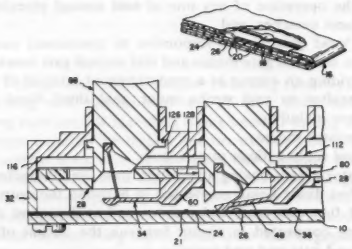
a sense circuit responsive to signals present on said first and second preselected signal ports of said hybrid network for developing impedance control signals equal in number to said preselected number to control said impedance parameters, respectively.

3,982,081

KEYBOARD ASSEMBLY WITH OVERLAPPED FLEXIBLE PRINTED CIRCUIT CABLE SWITCH

Henry William Demler, Jr., Lebanon, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 503,127, Sept. 4, 1974, abandoned.
This application May 20, 1975, Ser. No. 579,104
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.[2] H01H *13/70*; H05K *1/02*
U.S. Cl. 200—5 R 4 Claims



1. A keyboard assembly comprising:

a. a flat flexible cable with a portion thereof folded back over on itself and having contacts deposited on both facing surfaces, contacts on one surface being directly across from contacts on the other surface;

b. means for connecting the contacts into electrical circuits;

c. a layer of insulating material positioned between the two contact-carrying surfaces and having holes therethrough, said holes being in registration with opposing contacts;

d. a spring plate, overlying the folded over cable and containing a plurality of resilient first spring members, said members being formed from and integral with the plate, each member comprising a horizontal arm with a vertical arm extending obliquely upwardly and with a pair of spaced, semispherical heads on either side projecting downwardly and positioned adjacent an outside surface of the folded over portion of the cable with each head being in direct alignment with a contact located on the inside surface; and

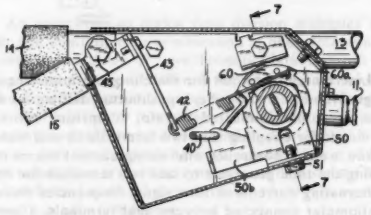
e. means for depressing the first spring members such that the horizontal arm rotates about its point of attachment with the plate and the semi-spherical heads push on the cable forcing the aligned contacts through the holes in the insulating material and into electrical engagement with the contacts on the facing surface.

3,982,082

STARTING SYSTEM

Richard A. Thorud, Bloomington; William D. Wood, Minneapolis, and Derald D. Ramsey, Richfield, all of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Aug. 4, 1975, Ser. No. 601,345
Int. Cl.[2] A01D *35/24*
U.S. Cl. 200—44 13 Claims



1. A lawn and garden implement starting system, comprising:

a. a mechanical actuator responsive to operator control and movable between a first and second position in response thereto;

b. a switch actuator operably engaged with said mechanical actuator and responsive to movement thereof to rotate a first and second position;

c. switch means actuatable by rotation of a portion thereof between a first and second position for opening and closing a starting circuit for said implement;

d. means for mechanically transferring rotational movement of said switch actuator to said switch means, and

e. lockout means, responsive to operator control, being movable from a position of engagement with said switch actuator to a position of disengagement for selectively preventing rotational movement of said switch actuator in response to movement of said mechanical actuator.

3,982,083

CONTACT SYSTEM FOR AN OUTDOOR ELECTRICAL SWITCH

Arthur D. Crino, Tigard, Oreg., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

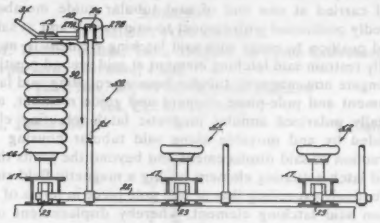
Filed Oct. 28, 1975, Ser. No. 625,859
Int. Cl.[2] H01B *31/00*
U.S. Cl. 200—48 A 5 Claims

1. In a contact arrangement for an outdoor electrical switch having a blade arm pivotally supported for movement between open and closed positions and constructed and arranged to provide an L current path;

means for carrying the blade for pivotal movement;

a contact finger support carried by said means in position to be engaged by said blade when it is moved to a closed position;

a first set of contact fingers carried by said contact finger support; and



a second set of contact fingers carried by said contact finger support in opposing spaced relationship to said first set contact fingers and of a number greater than the number of contact fingers in said first set of contact fingers;

whereby the greater number of contact fingers opposes the magnetic forces on the blade to thereby establish good electrical engagement between the blade and the opposing greater number of contact fingers.

3,982,084

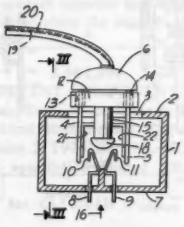
SHOCKPROOF ELECTRICAL WALL RECEPTACLE

Norman Cooperstein, Long Beach, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 23, 1975, Ser. No. 625,256

Int. Cl.² H01V *33/30*

U.S. Cl. 200—51.09 **2 Claims**



1. A shockproof electrical wall receptacle having a box with a wall side having an opening formed therethrough for the prongs of an electrical connector plug and a back side having a pair of electrically conductive circuit members passing therethrough into the box in electrically insulative relation with the box and with each other, said receptacle comprising

resilient ends of electrically conductive material extending from the ends of the electrically conductive circuit members in the box in spaced angular relation with each other in a generally V shape and positioned between the prongs of an electrical connector plug inserted in the box and spaced therefrom;

a housing of substantially rectangular parallelepiped configuration movably mounted in the opening in the box for selective insertion into the box flush with the wall side of the box and extension therefrom, said housing having a pair of spaced slots formed therein for accommodating the prongs of an electrical connector plug; and

a plunger affixed to the housing and extending through the opening through the wall side for movement in axial directions, said plunger having a head of electrically insulative material at an end in the box in proximity with the resilient ends of the circuit members equidistantly spaced therefrom and therebetween in a manner whereby in the absence of an electrical connector plug in the receptacle the housing extends from the box and the plunger is spaced from the resilient ends of the circuit members and the circuit members are maintained in open circuit relation although an electrically conductive object inserted into the box via either slot in the housing is free from contact with one of them and when an electrical connector plug is inserted in the housing, the housing is moved into the receptacle and said housing moves the plunger further into the box so that the head of the plunger abuts the resilient ends of the circuit members and moves said ends farther apart into electrical contact with the corresponding prongs of the electrical connector plug thereby closing the circuit of the circuit members via conductors connected to said prongs via said plug.

3,982,085

STOCK SENSING DEVICE

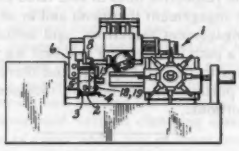
Joseph Henry Cox, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Sept. 16, 1974, Ser. No. 506,286

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² H01H *3/16*

U.S. Cl. 200—61.41 **5 Claims**



1. In a machine tool, having a rotating chuck with work gripping members for holding a workpiece being machined, an apparatus for sensing sufficient chucking stock comprising:

a. a body, mounted to said rotating chuck, having its central axis coincident with the axis of rotation of said chuck;

b. an axial bore through the central axis of said body, through which predetermined increments of stock are fed for successive machining operations;

c. an indicator pin, slidably adapted in a radial bore in said body, and located within the dimensional range of the axial length of said work gripping members;

d. mechanical means urging said indicator pin inwardly towards the central axis of said body such that said pin bears on the outer diameter surface of various work sizes when present in said axial bore, and said pin moves inward radially to said central axis of said body when no stock is present at the inwardly-directed end of said indicator pin, and further wherein said mechanical means can trip a stationary signal means when no stock is present beneath said inwardly-directed end of said indicator pin and while said chuck is rotating; and

e. signal means mounted on said machine tool in a stationary position relative to said rotating chuck, wherein said signal means has a signal operator capable of engaging said mechanical means at a predetermined signal position while said body is rotating and said signal means is stationary.

3,982,086

ELECTRICAL SWITCH CONSTRUCTION

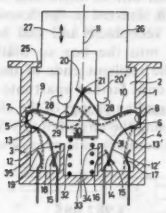
Erich Marquardt; Werner Storz, both of Rietheim, and Eckehardt Sachs, Spaichingen, all of Germany, assignors to Firma J. & J. Marquardt, Germany

Filed May 8, 1975, Ser. No. 575,531

Claims priority, application Germany, May 13, 1974, 2423075

Int. Cl.[2] H01H *13/36*

U.S. Cl. 200—67 DA 9 Claims



1. An electrical switch, comprising a housing having spaced apart side walls each with a bearing recess, first and second laterally spaced fixed contacts located between said side walls, an actuator guided between said side walls for movement in directions toward and away from said fixed contacts, first and second substantially U-shape contact springs having first leg portions pivotally connected together, intermediate web portions pivoted in separate adjacent ones of said bearing recesses and second leg portions respectively movable toward and away from respective ones of said fixed contacts for electrical contact engagement therewith and in an opposite direction for disengagement therefrom, said actuator being movable through a path intercepting said first leg portions of said contact springs to flex said springs and thereafter pivot said intermediate portions in said bearing recesses and move said second leg portions.

3,982,087

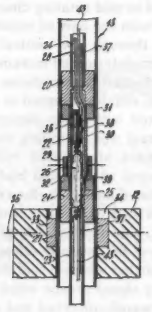
LIQUID-LEVEL INDICATING MEANS

Albert J. Bachman, Bristol, Conn., assignor to De Laval Turbine Inc., Princeton, N.J.

Filed Feb. 27, 1975, Ser. No. 553,508

Int. Cl.[2] H01H *35/18*

U.S. Cl. 200—84 C 22 Claims



1. A magnetic-latching position-indicating transducer, comprising a magnetic-reed switch having contacts operable to open and close electric-circuit connections depending upon the presence or absence of a predetermined magnetic-field strength, an elongate non-magnetic tubular guide member encasing said switch near one to the exclusion of the other end thereof, an axially polarized annular magnetic latching element movably mounted upon said guide member and with respect to said switch over a displacement between a first position in actuating relation with said contacts to electrically close the same and a second position out of controlling relation with said contacts so as to electrically open the same, an annular pole-piece element of magnetic flux-conducting material carried at one end of said tubular guide member and fixedly positioned with respect to said switch and at said second position to coact with said latching element to magnetically restrain said latching element at said second position, an elongate non-magnetic tubular housing encasing said latching element and pole-piece element and guide member, and an axially polarized annular magnetic latch-actuating element guided by and movable along said tubular housing in the direction of said displacement and beyond the limits thereof, said latch-actuating element having a magnetic-field strength effectively exceeding that of said pole piece in terms of action upon said latching element, whereby displacement of said latch-actuating element between said positions is operative to determine the electrically open or closed condition of said contacts, and further whereby the electrically open condition of said contacts will be maintained by pole-piece retention of said latching element in its second position for such further displacements of said latch-actuating element as may occur away from said switch and beyond said second position.

3,982,088

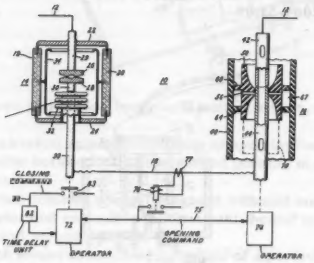
HIGH-VOLTAGE ELECTRIC CIRCUIT BREAKER COMPRISING SERIES-CONNECTED VACUUM INTERRUPTER AND FLUID BLAST INTERRUPTER

Joseph W. Porter, Media, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Apr. 3, 1975, Ser. No. 564,963

Int. Cl.[2] H01N *33/66*

U.S. Cl. 200—144 B 6 Claims



1. A high-voltage alternating-current circuit breaker comprising:

a. a first circuit interrupter of the vacuum-type comprising a pair of contacts separable to establish an intercontact gap and a highly evacuated insulating housing enclosing said contacts,

b. a second circuit interrupter of the fluid-blast type comprising a pair of contacts separable to establish an intercontact gap and means for producing a fluid blast through said inter-contact gap upon contact separation,

c. means connecting said first and second interrupters electrically in series,

d. means for separating the contacts of said interrupters substantially simultaneously during circuit interruption to develop arcs across said gaps,

e. said second interrupter being characterized by a slower dielectric recovery rate than said vacuum interrupter during the initial period when recovery voltage is being applied across said inter-contact gaps immediately following arc extinction but an ability to withstand higher peak recovery voltages than said vacuum interrupter after

said initial period if no breakdown occurs during said initial period,

f. and means for reclosing said vacuum interrupter immediately after said second interrupter has successfully withstood the recovery voltage applied thereacross and while said second interrupter remains open.

3,982,089

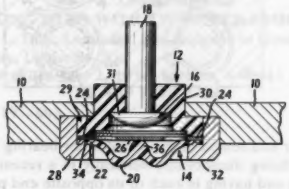
PUSHBUTTON SWITCH

Tom M. Hyltin, Dallas, Tex., assignor to Seiko Instruments Incorporated, Torrance, Calif.

Filed Nov. 29, 1974, Ser. No. 528,230

Int. Cl.² H01H 3/12

U.S. Cl. 200—159 B 7 Claims



1. A pushbutton switch adapted to be sealably mounted in an aperture of a casing, the switch comprising a housing including an outer conductive portion, an inner insulating portion, and a cavity in the housing; a flexible diaphragm enclosing the cavity and adapted to be accessible from outside the housing and casing, peripheral portions of the diaphragm being engaged by the housing to seal the cavity in the housing; a first electrically conducting contact member within the cavity and extending through the insulating portion of the housing into the casing; and a second electrically conducting contact member mounted between the housing portions with a resilient portion within the cavity between the first contact member and the diaphragm so that depressing the diaphragm moves the second contact member into engagement with the first contact member to close the switch.

3,982,090

DETENT COMPONENT

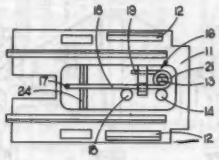
Keith Lewis, Burnley, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed June 2, 1975, Ser. No. 582,940

Claims priority, application United Kingdom, June 14, 1974, 26433/74

Int. Cl.² H01H 13/38

U.S. Cl. 200—291 2 Claims



1. A detent component for use in a detent assembly of the kind capable of latching a linearly movable member in a predetermined position relative to a fixed member, the component including a mounting piece whereby the component can be secured to either the movable or the fixed member of a pair of relatively linearly movable members, and a cam follower carried by said mounting piece and engageable with a detent cam form on the other of said pair of members, said cam follower being defined by an upturned end region of a first limb of a hairpin type spring the second limb of which engages a stop on said mounting piece, the junction region of the first and second limbs defining a loop encircling an anchor post on the mounting piece and said first limb abutting a pair of spaced abutments on the mounting piece, said pair of abutments being positioned so that in use they are aligned parallel to the direction of relative movement of said members, and the resilience of the spring causing said first limb to engage said abutments so that the abutments define a rest position of said limb, in use, parallel to said direction of relative movement.

3,982,091

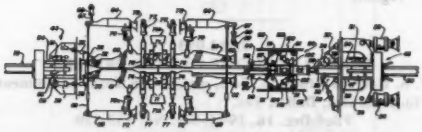
WELDING APPARATUS

Hans R. Zollinger, Geroldswil, Switzerland, assignor to H. A. Schlatter AG, Zurich, Switzerland

Filed Oct. 15, 1974, Ser. No. 514,396

Int. Cl.² B23K 11/04

U.S. Cl. 219—101 29 Claims



1. Welding apparatus for welding rail sections together in end to end relationship to form a continuous rail comprising, in combination: a pair of vertical clamping assemblies for vertically clamping and aligning the respective ones of a pair of rail sections to be welded together to form a continuous rail, said vertical clamping assemblies including electrodes engageable with adjacent ends of a pair of rail sections to be welded together; means for causing current flow between said electrodes and through the ends of said rail sections in order to make a weld; a pair of horizontal clamping assemblies for horizontally clamping and aligning the respective ones of said pair of rail sections; said vertical clamping assemblies each comprising a pair of upper and a pair of lower lever arms, the lever arms of each pair being spaced on opposite sides of a rail section and being pivotally affixed for rotation in a vertical plane at one end thereof and having one of said electrodes connected between the opposite ends thereof so as to engage the upper and lower surfaces of said rail section when the respective pairs of said lever arms are pivotally rotated, said upper and lower pairs of lever arms being rigid in the vertical plane thereof and being flexible within limits in a horizontal plane, whereby no undue stress is placed on said lever arms during horizontal alignment of said rail sections, and means for pivotally rotating the respective pairs of lever arms to engage said electrodes with said rail section to vertically clamp said rail section between them.

3,982,092

ELECTRICALLY HEATED ZONED WINDOW SYSTEMS

James G. Marriott, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Sept. 6, 1974, Ser. No. 503,808

Int. Cl.² H05B 1/02; E06B 7/12; H05B 3/10

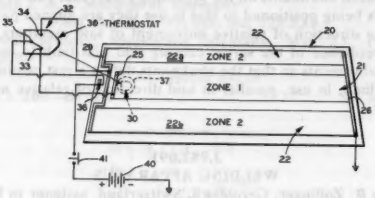
U.S. Cl. 219—203 13 Claims

1. In an electrically heated window system of the type having at least two heatable zones, wherein each zone is provided with its own independent electrical resistance heating element and a supply of electrical potential connectable to said heating elements of said zones for energization thereof, the improvement comprising:

a. means for producing a higher temperature in a selected region in one of said heatable zones than the average overall temperature produced by said heating element in said one zone;

b. means located at said selected region for sensing its said higher temperature; and

c. means operated by said temperature sensing means for initially connecting the heating element of said one heat-



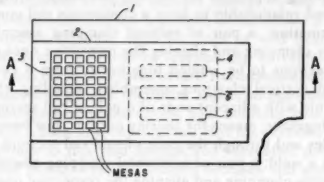
able zone to said supply of electrical potential and then alternately cycling the electrical potential between the respective heating elements of said zones in accordance with the rise and fall of the temperature in said selected region.

3,982,093

THERMAL PRINTHEAD WITH DRIVERS

W. S. Henrion, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 16, 1974, Ser. No. 533,429
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—216 **7 Claims**



1. A thermal printhead comprising a plurality of mesas arranged on a substrate, each of said mesas containing heat dissipative semiconductor means for operation in either a quiescent or a heat dissipating state and switchable from said quiescent to said heat dissipating state in response to input signal to the mesa of amplitude as low as 0.4 milliamperes.

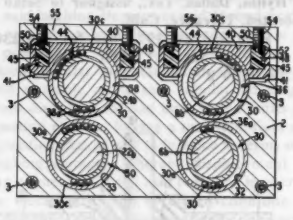
3,982,094

APPARATUS FOR FIXING TONER IMAGES

Francis L. Kratcoski, Lincolnshire, and William Brahos, Chicago, both of Ill., assignors to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Jan. 2, 1975, Ser. No. 538,038
Int. Cl.[2] H05B *1/00*; **G03G** *15/20*
U.S. Cl. 219—216 **5 Claims**

1. Apparatus for fixing an image of fusible toner particles on flexible sheet material, comprising upright frames spaced apart at opposite side of the apparatus and defining a fixing zone therebetween, means for feeding said material with said image thereon into said zone at a substantially constant speed, two pressure rollers having coengaging smooth rigid peripheral surfaces pressed and rotated together, one over and upon the other, for engaging and advancing said material therebetween as said material passes said zone, means for rotating said rollers at a peripheral speed equal to said feeding speed, and means for constantly pressing each end of the upper of said rollers against the adjacent end of the lower of them under a selected force of between about 20 and about 3400 pounds per inch of length of the nip between said roller surfaces, said force being sufficiently great to join the toner particles superficially to one another and to the surface structure of said material by pressure as said material is advanced between said surfaces, each of said rollers having on its ends journals rotatable in respective surrounding anti-friction bearing units seated in respective recesses in said frames, each said bearing unit of the upper roller having a non-rotary outer bearing race that is free of constraint in downward direction otherwise than by the coengaging rigid peripheral surfaces of said rollers, a rigid pressure distributing block extending trans-



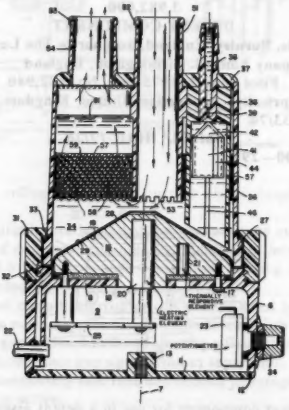
versely over and seated on each said outer bearing race, each said block being displaceable vertically in a recess in one of said frames and having in each of its opposite end portions an upwardly open pocket containing a confined body of elastomeric material, a pressure member bearing downward upon each said elastomeric body, and adjustably settable means mounted in upper portions of said frames for holding each said pressure member pressed under a selected force against the related elastomeric body.

3,982,095

RESPIRATORY HUMIDIFIER

Thomas C. Robinson, Berkeley, Calif., assignor to Searle Cardio-Pulmonary Systems Inc., Emeryville, Calif.

Filed Oct. 4, 1973, Ser. No. 403,507
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976
Int. Cl.[2] H05B *1/00*; **A61M** *15/00*; **B01F** *3/04*
U.S. Cl. 219—273 **8 Claims**



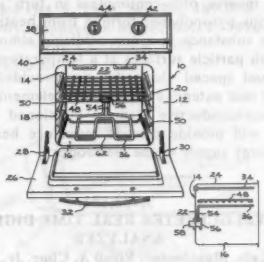
1. A respiratory humidifier comprising a base, a heater mounted on said base and having a first heat transfer surface, a container having a second heat transfer surface complementary to said first heat transfer surface, means associated with said base and said container for urging said first heat transfer surface and said second heat transfer surface substantially into abutment, means on said container for admitting liquid to the interior thereof at a lower location near said second heat

transfer surface, means for establishing a predetermined liquid level in said container, means on said container for admitting gas to the interior thereof at a location near said second heat transfer surface and below said liquid level, means on said container for releasing gas therefrom at an upper location remote from said second heat transfer surface and above said liquid level, and a pad in and extending substantially completely across said container and disposed between said lower location and said upper location, said pad being permeable throughout to said liquid and to said gas and providing an extended surface for wetting by said liquid and said pad having an upper surface substantially coincident with said liquid level.

3,982,096
BAKING OVEN WITH TWO-SIDED BROILING

Raymond L. Dills, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 2, 1976, Ser. No. 646,411
Int. Cl.² F27D *11/02*
U.S. Cl. 219—403 **8 Claims**

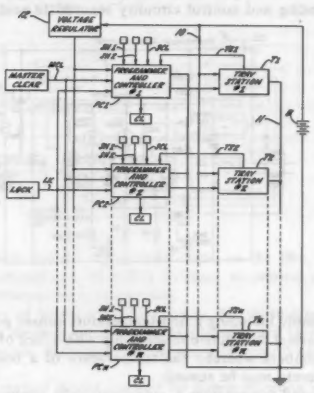


1. A baking and broiling oven comprising:
an oven cooking cavity formed by a box-like oven liner and a front-opening access door;
vertically adjustable shelf means for supporting food at various elevations within the oven cooking cavity;
electrical resistance heating means for the oven including an upper horizontal broiling element located adjacent the top wall of the oven liner, and a lower horizontal baking element located adjacent the bottom wall of the oven liner;
the invention comprising the baking element having vertical terminal means arranged adjacent a vertical wall of the oven liner, the terminal means having an electrical plug connector arranged at an elevation slightly below the mid-height of the vertical wall, and an electrical plug receptacle mounted in the said vertical wall at an elevation slightly below the mid-height of the vertical wall for receiving the plug connector and making an electrical connection therebetween.
the plug connector being reversible in the plug receptacle so the baking element may be arranged closely parallel to the upper broiling element for performing a simultaneous two-sided broiling operation;
and support means for holding the baking element in the reversible elevated position.

3,982,097
PROGRAMMABLE ELECTRONIC CONTROL SYSTEM FOR MULTIPLE ELECTRIC STATIONS

Gene J. Seider, Bloomington, and Michael C. Freund, Mendota Heights, both of Minn., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 30, 1975, Ser. No. 573,344
Int. Cl.² H05B *1/02*
U.S. Cl. 219—486 **24 Claims**



1. A programmable electronic control system for an array of food tray stations each of which is adapted to receive a food tray having a plurality of electrical heaters therein, said system comprising the combination of
a. a plurality of controllable power circuits associated with each tray station for supplying separately controllable power to each individual heater,
b. manually operable programming means connected to each power circuit and including means for generating control signals to enable or disable each separate power circuit to permit the programming of the entire array of tray stations,
c. manually operable station reset means connected to each programming means for removing any enabling control signals generated by the respective programming means to permit the re-programming of individual tray stations,
d. manually operable master reset means connected to all the programming means for removing any enabling control signals generated by any of the programming means to permit the re-programming of the entire array of tray stations,
e. and tray sensing means at each tray station for disabling the power circuits associated with the respective tray stations in response to the absence of trays at the respective stations, and for enabling the programming means associated with the repsective tray stations in response to the presence of trays at the respective stations.

3,982,098
HEATER AND CONTROL SYSTEM

Richard M. Trostler, 1730 Woodbend Drive, Claremont, Calif. 91711

Filed Dec. 23, 1974, Ser. No. 535,557
Int. Cl.² H05B *1/02*
U.S. Cl. 219—501 **9 Claims**

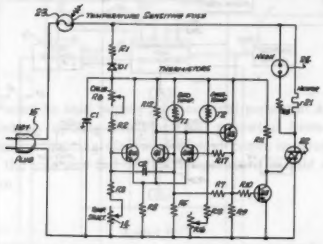
1. A combined heater, control circuit and power supply for water beds comprising;
a pair of elongated planar dielectric flexible members in bonded engagement on adjacent faces;

an electrical heating element between said members substantially covering one face of one of said flexible members except for a local region;

a circuit assembly positioned between said members in said localized region including a power supply adapted to be connected to the source of electrical current;

said circuit assembly including switch means for applying and interrupting electrical cuurrent to said heating element;

said circuit assembly means also including temperature sensing and control circuitry secured to said circuit assembly including a first temperature sensor positioned in thermal conductive relationship with a face of one of said members whereby the temperature of a body adjacent thereto may be sensed;



a second temperature sensor electrically connected to said circuit assembly extending off said circuit assembly and in thermal conduction relationship with said heating element; and

circuit means responsive to either said first or second temperature sensor to operate said switching means;

said circuit assembly and heating element being secured into a sealed unitary assembly between said members.

3,982,099

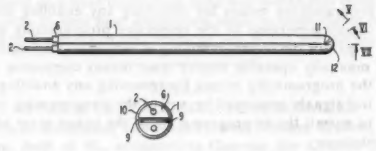
BILATERAL HEATER UNIT AND METHOD OF CONSTRUCTION

John W. Churchill, 12 Winthrop Ave., Beverly, Mass. 01915

Filed July 25, 1973, Ser. No. 382,295

Int. Cl.² H05B *3/44*

U.S. Cl. 219—544 **10 Claims**



1. A heater unit comprising an elongated outer metallic sheath which is semicircular in cross section along at least a portion of the length thereof including the end portions, metal terminal means at respective end portions of the sheath extending within and in the longitudinal direction of the sheath, said metal terminal means having a portion lying within the sheath and having a portion extending outwardly beyond the end of the sheath, said portion of said metal terminal means lying within the sheath having a cross-sectional shape corresponding substantially to the cross-sectional shape of the sheath, an insulating end plug surrounding said metal terminal means and extending at least partially within said sheath, a resistor helix disposed within the sheath and secured to portions of said metal terminal means and extending therebetween, said resistor helix having a cross-sectional shape corresponding to the cross-sectional shape of the surrounding sheath, and compacted powder insulation completely filling the sheath and spacing the resistor helix and a portion of the metal terminal means from the sheath.

3,982,100

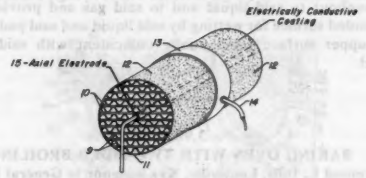
MONOLITHIC HONEYCOMB FORM ELECTRIC HEATING DEVICE

George L. Hervert, Woodstock, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 8, 1974, Ser. No. 513,028

Int. Cl.² H05B *3/10*

U.S. Cl. 219—553 **2 Claims**



1. A resistance heating device which comprises in combination a rigid monolithic resistance heating element with an extended surface area comprising a honeycomb type structure with a plurality of passageways therethrough and resulting from an admixture of semiconductive refractory inorganic oxide particles with a thermally unifiable ceramic material, and said semiconductive particles have a semiconducting coating thereon with a conductivity of from about 10^{-8} to about 10^{3} inverse ohm-centimeters in turn provided by a carbonaceous pyropolymer formed from heating an organic pyrolyzable substance in a non-oxidizing atmosphere and in contact with particle surfaces at a temperature above about 400° C., and spaced electrodes are provided to opposing portions of said extended surface area element, whereby the resulting semiconductive element positioned between such electrodes will provide electric resistance heating from an electric energy supply to the electrodes.

3,982,101

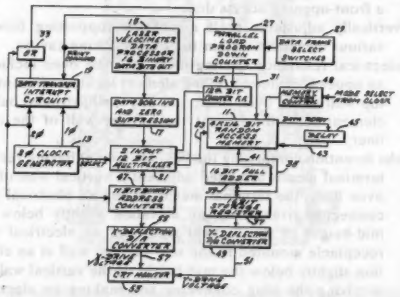
LASER VELOCIMETER REAL TIME DIGITAL DATA ANALYZER

Henry T. Kalb, Manchester; Virgil A. Cline, Jr., and Bruce W. Bomar, both of Tullahoma, all of Tenn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 19, 1975, Ser. No. 578,845

Int. Cl.² G06F *15/30*

U.S. Cl. 235—152 **3 Claims**



1. A digital analyzer for a velocimeter data processor comprising:

a. a clock having first and second phase outputs;

b. a data interrupt circuit fed by the first and second phase outputs of the clock and activated by a command from the data processor;

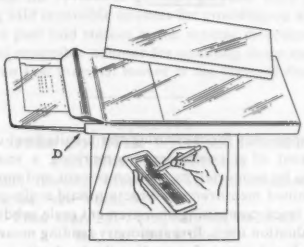
c. a multiplexer fed by the data processor;
d. a random access memory fed by the multiplexer and initiated by the data interrupt circuit and having a read-out terminal and a data-in terminal;
e. a down counter fed by the command from the data processor;
f. a flip-flop activated by the down counter, the output thereof being fed to the multiplexer;
g. a full adder fed by the readout terminal of the random access memory and fed back thereto at the data-in terminal;
h. an address counter driven by the second phase of the clock and activating the multiplexer;
i. a cathode ray tube having an *x*-deflection terminal and a *y*-deflection terminal;
j. a first digital-to-analog converter fed by the random access memory and connected to the y-deflection terminal of the cathode ray tube; and
k. a second digital-to-analog converter fed by the address counter and connected to the *x*-deflection terminal of the cathode ray tube.

3,982,102

METHOD OF RECORDING BETS IN A LOTTERY AND SELECTING THE WINNERS BY ELECTRONIC COMPUTERS

Humberto José De Carvalho Cidade, Avenida Erasmo Braga, No. 277, Rio de Janeiro, Guanabara, Brazil

Filed Oct. 6, 1971, Ser. No. 187,050
Claims priority, application Brazil, Oct. 7, 1970, 222823
Int. Cl.[2] G06K *1/00*
U.S. Cl. 235—61.6 E **1 Claim**



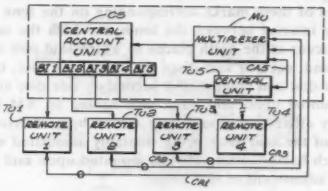
1. A method of recording bets in a public lottery based upon the outcome of one or more sporting events and selecting the winners comprising the steps of:
marking the name and address of the bettor, the number of bets, the amount of the bets and the prediction of the results of said sporting events on an entry sheet containing a list thereof,
placing said sheet on top of two Hollerith type punch cards adapted to operate in electronic computers,
said punch cards containing bet indicating spaces corresponding to the bet indicating spaces on said sheet,
placing the thus arranged sheet and punch cards in a manual perforating device,
perforating said sheet and cards by a punching instrument at the spaces on said sheet where the predictions have been marked,
marking the name and address of the bettor on said punch cards, for visual use one of said cards being retained by the bettor, the data on the other of said cards being recorded by means of computers on magnetic tapes,
composing a master punch card containing the data indicating the results of the particular sporting event or events and,
inserting said master card into a computer to select the winners of the contest based upon previously stored data appearing on the other of said punch cards.

3,982,103

CREDIT VERIFICATION SYSTEM

Robert N. Goldman, Kailua, Hawaii, assignor to Telecredit, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 406,063, Oct. 12, 1973, Pat. No. 3,891,830, which is a continuation of Ser. No. 150,601, June 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 558,127, June 16, 1966, Pat. No. 3,610,889. This application June 23, 1975, Ser. No. 589,649
Int. Cl.[2] G06K *7/08, 19/08;* **H04Q** *11/04*
U.S. Cl. 235—61.7 B **12 Claims**



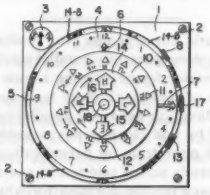
1. A system for use with credit cards, or the like, which includes a changeable recording medium, to control uses in relation to transactions, comprising:
a plurality of terminal sensing means for sensing said recording medium on said card to provide card identification signals, first card use signals, and second card use signals;
a central station means coupled for communication with at least some of said terminal sensing means during on-line operation, said central station means for receiving signals from specific of said terminal means during said on-line operation to provide approval-related signals responsive to signals from said specific terminal means;
and
a plurality of card processor means coinciding in number to said terminal sensing means and coupled thereto for providing approval-related signals other than during on-line operation, and for recording fresh first card use signals on said card to reflect each card-supported transaction and for recording fresh second card use signals on said card to reflect transactions not communicated to said central station means prior to approval.

3,982,104

TIDE AND TIME CALCULATING DEVICE

Philip M. Banner, 28 Oxford Road, Massapequa, N.Y. 11758

Continuation-in-part of Ser. No. 243,001, April 11, 1972, Pat. No. 3,825,181. This application June 13, 1974, Ser. No. 479,248
Int. Cl.[2] G06C *3/00;* **G04B** *19/26*
U.S. Cl. 235—88 N **6 Claims**



1. A tide time indicating device of the character described showing the precalculable relationship between tide, time, date and place comprising a base having a clock face disc with hour and minute numerals thereon, hands for hour minute and seconds displaying time at every moment connected to a motor drive means therefor, a clock motor driven tide disc

comprising marks corresponding to different tide phases and being set apart from each other through distances which correspond on said clock face disc to the times elapsing between said time phases, and a clock motor driven calendar disc comprising a predetermined sequence of regularly staggered marks at approximately 50 minutes apart corresponding to successive days, the space between two consecutive marks of said calendar disc at least corresponding on said time disc to the mean interval between the times when the same tide phase occurs at the same place on two consecutive days, a comparative rotatable secondary tide disc comprising marks corresponding to different earth places, the distance between any two ones of these marks corresponding on the time scale to the time interval between the times at which the same tide phases occur at the earth places to which said pair of marks correspond, each of said discs the clock face disc, tide disc, calendar disc and comparative secondary tide disc are coaxially mounted upon said base, also having an AM PM disc rotatably affixed upon said base turned by said drive means and all of the said discs being rotatably associated with said base each having setting crowns mounted upon said base for manual adjustment of said discs.

3,982,105

DEVICE FOR THE AUTOMATIC READING AND EVALUATION OF RECORDED CURVES

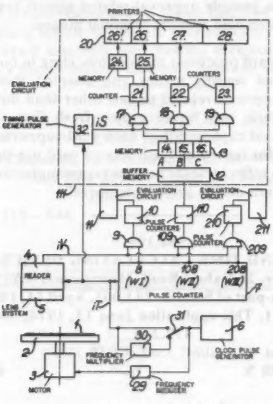
Karl Heinz Eberle, Carouge, Switzerland, assignor to TVI-Television Industrielle S.A., Switzerland

Filed Nov. 11, 1974, Ser. No. 522,868

Claims priority, application Switzerland, Nov. 16, 1973, 16157/73

Int. Cl.² H03K *21/34*

U.S. Cl. 235—92 DN **1 Claim**



1. An automatic curve reader, for reading a plurality of curves disposed along generally parallel tracks, comprising: a clock pulse generator for developing a train of clock pulses; means receptive of said clock pulse train for displacing said curves along a direction generally parallel to said tracks at a rate determined by said clock pulses; scanning means receptive of said clock pulse train for periodically photoelectrically scanning transversely across said tracks and for passing clock pulses therethrough for the duration for which each curve is scanned; and counter means receptive of said clock pulse train for counting clock pulses passed through said scanning means at a rate determined by said clock pulses train and at counting intervals corresponding to the widths of said tracks, said counter means having a plurality of outputs each for developing an output signal representative of the number of clock pulses counted during a respective one of said counting intervals, whereby the different output signals developed by said counter means simultaneously represent widths of respective ones of said curves.

3,982,106

SYSTEM FOR MEASURING THE LONGITUDINAL OR ANGULAR DISPLACEMENT OF A MOVABLE COMPONENT

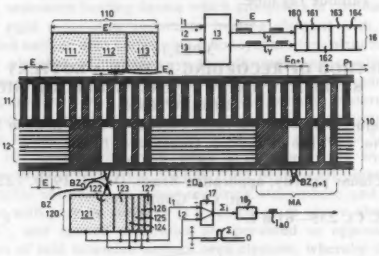
Theo Stutz, Basserdorf, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Continuation of Ser. No. 467,289, May 6, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,723

Claims priority, application Switzerland, May 14, 1973, 6792/73

Int. Cl.² G06M *3/14*; H01J *5/16*

U.S. Cl. 235—92 GC **7 Claims**



1. An apparatus for measuring the longitudinal or angular displacement of a component, comprising a scale carrier adapted to be supported by the component and movable in a predetermined measurement direction, said scale carrier having a first track comprising an increment scale subdivided into equal graduation units, first stationary reading means defining a first reading location for reading the graduation units moving past the reading location, evaluation means in circuit with said first reading means and comprising an increment counter for the continuous storage of the algebraic sum of the graduation units of the increment scale moving past said first reading location and read by said first reading means, the movable scale carrier possessing a second track arranged substantially parallel to the increment scale, said second track containing a multiplicity of absolute value markings, each marking possessing a predetermined spacing from the next following marking, second stationary reading means defining a second reading location for reading the absolute value markings moving past the second reading location, said evaluation means including means for counting each said spacing in graduation units of the increment scale, the spacing of each marking from the next following marking characterizing an absolute value of its spacing from a null position, said evaluation means including a fixedly programmed allocation device, said evaluation means including means for determining the number of graduation units of the increment scale which have been counted sign-correct at the increment counter from the time of throughpassage of any given one of the absolute value markings up to the throughpassage of the next following absolute value marking, said evaluation means further ascertaining for said characteristic spacing value the associated correct absolute value from said fixedly programmed allocation device and correcting any possibly previously incorrect counter state of the increment counter to the correct absolute value.

3,982,107

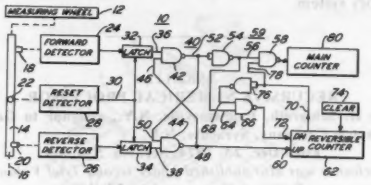
REVERSIBLE MEASURING MEANS

Michael Butler, Warminster, Pa., assignor to American Electronic Laboratories, Inc., Colmar, Pa.

Filed Sept. 9, 1974, Ser. No. 504,322

Int. Cl.² G06M 3/14; H03K 21/02

U.S. Cl. 235—92 DN 10 Claims



1. A reversible measuring means for measuring material moving past a station in a forward direction while taking into account movement in a reverse direction comprising a main counter for counting in the forward increasing direction only and a reversible counter for counting up from a fixed count and counting down to said fixed count, detector means including a plurality of sequentially energizable detectors delivering output signals indicative of the forward and reverse directions of movement and quantity of material moving past a station, and control means receiving signals from said detector means and activating said main counter for counting material moving past said station in the forward direction by increasing its count when the reversible counter has said fixed count and activating said reversible counter for counting up when material moves past said station in the reverse direction and activating said reversible counter for counting down to said fixed count when said material moves in the forward direction.

3,982,108

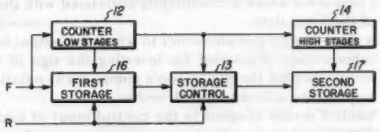
HIGH-SPEED COUNTER WITH RELIABLE COUNT EXTRACTION SYSTEM

James Othel Horsley, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1975, Ser. No. 563,685

Int. Cl.² H03K 21/08

U.S. Cl. 235—92 EA 2 Claims



1. The combination comprising,

counter means coupled to a source means for pulses to be counted, said counter means being divided into a first plurality of low order stages and a second plurality of high order stages;

first storage means for storing the count value in said first plurality of stages in response to said pulses to be counted;

means responsive to a first control signal for inhibiting the first storage means;

storage control means responsive to said first storage means, to said first control signal, and to said first plurality of stages for producing a store signal; and

second storage means coupled to the second plurality of stages for storing its count value in response to said store signal.

3,982,109

CIRCUIT ARRANGEMENT FOR THE FORMATION OF A SUM AND/OR DIFFERENCE SIGNAL

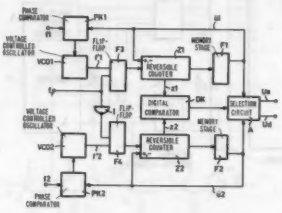
Martin Klinck, Uetersen, and Udo Mersiowsky, Hamburg, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,937

Claims priority, application Germany, Apr. 27, 1974, 2420638

Int. Cl.² G06F 15/20; H03B 3/04

U.S. Cl. 235—150.3 12 Claims



1. A circuit for the formation of a sum and difference signal whose frequencies correspond to the sum and the difference frequencies respectively of the frequencies of first and second input signals, comprising means for applying the two input signals to a comparator means as symmetrical triangular signals whose amplitude values increase and decrease as a linear function of time, said comparator means producing an output signal upon equality of the instantaneous values of the two triangular signals applied thereto, a selection circuit coupled to the output of the comparator means and responsive to said output signal, said selection circuit having output means for supplying said difference signal for a corresponding direction of the variation of the values of the triangular signals and said sum signal for an opposite direction of the variation of the values of the triangular signals, means for the formation of the triangular signals including first and second reversible counters each having the same counting capacity (Z_M) for each input signal received, means for applying to the inputs of said first and second counters first and second counting clock pulse trains respectively, which correspond to the frequency of said first and second input signals so that the counts represent the amplitude values of the triangular signals, first and second memory devices coupled to said first and second counters, respectively, and responsive to the attainment of the final count values of the respective counters to derive an output signal which reverses the counting direction of the relevant counter and represents a direction signal for the direction of the variation of the amplitude values of the triangular voltage, and means for driving the selection circuit with the output signals of the memory devices.

3,982,110

INPUT TRANSFER SYSTEM FOR ELECTRONIC COMPUTER

Yoshio Kawai, Tokyo, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1974, Ser. No. 532,103

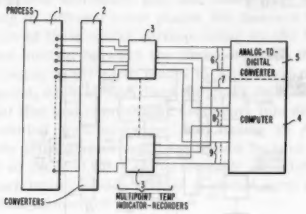
Claims priority, application Japan, Dec. 13, 1973, 48-139499

Int. Cl.² H03K 13/02; G01K 7/12

U.S. Cl. 235—151.3 3 Claims

1. In a computer-controlled process control system including means for measuring a plurality temperatures at various points in the process and generating electric signals corresponding to the temperatures measured, a plurality of multipoint temperatures indicator-recorders connected to said measuring means and displaying and/or recording the measured temperatures, said multi-point temperature indicator-

recorders including linearity correcting means connected to outputs thereof for correcting the linearity of output analog signals, and an electronic digital computer for controlling the process, said computer having an analog-to-digital converter for converting input analog signals to digital signals for processing by said computer, the improvement comprising an



input transfer system for automatically transferring and sequentially introducing the analog signals from each of said multi-point temperature indicator-recorders to said analog-to-digital converter in said computer, said transfer system including means in said multi-point temperature indicator-recorders for delivering input instruction signals to said computer to cause the automatic transfer of said analog signals.

3,982,111

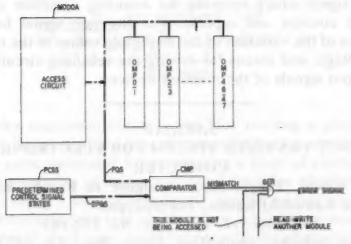
MEMORY DIAGNOSTIC ARRANGEMENT

Edward Mark Lerner, Glendale Heights, Ill.; David Cartwright Peterson, Neptune, N.J.; Terrence Thomas Quin, Holmdel, N.J., and Bernard George Ruel, Belmar, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 4, 1975, Ser. No. 601,477

Int. Cl.² G11C *29/00*

U.S. Cl. 235—153 AM **21 Claims**



1. For use with a memory system having an addressable memory module, means for providing an enable signal when said module is to be accessed, access means controlled by said enable signal for applying control signals including an address indication to leads extending to said module to control the accessing of information stored therein and in the absence of said enable signal for causing said leads to assume predetermined states; diagnostic apparatus comprising

means connectable to said leads for detecting the states thereof and for providing a first indication if said leads are not in said predetermined states, and

means jointly responsive to said first indication and to the absence of said enable signal for providing an error signal thereby indicating a potential malfunction in said memory system.

3,982,112

RECURSIVE NUMERICAL PROCESSOR

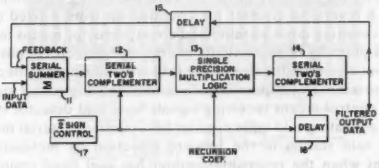
Fritz H. Schlereth, Baldwinsville, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 23, 1974, Ser. No. 536,009

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² G06F *7/38*

U.S. Cl. 235—156 **7 Claims**



1. In a recursive processor subject to error integration, the combination comprising:

a. input terminal means for connection to a source of input data representing a time series, said input data being expressed in successive words in two's complement notation,

b. a first two's complementer to which said input data from said input terminal means is coupled for inverting the sign of serial words coupled thereto in two's complement notation in response to a control signal,

c. a numeric sub-processor coupled to the output of said first two's complementer for accepting input data in two's complement notation, said sub-processor being subject to a bias error which is consistently correlated with the sign of the input data,

d. a second two's complementer to which the output of said subprocessor is coupled for inverting the sign of serial words coupled thereto in two's complement notation in response to a control signal, and

e. control means coupled to the control input of said first and second two's complementers to invert and reinvert respectively the sign of alternate words to substantially cancel said bias error without changing the sign of the output data stream.

3,982,113

ACOUSTOELECTRIC WAVE SEMICONDUCTOR SIGNAL PROCESSING APPARATUS WITH STORAGE OF WEIGHTING FACTOR

Larry Allen Coldren, Leonardo, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 5, 1974, Ser. No. 520,924

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² G06G *7/19*; **H03H** *9/24*

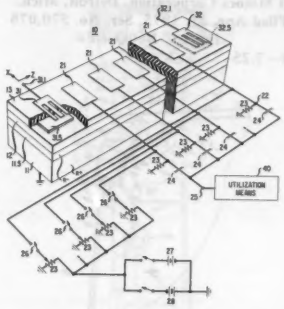
U.S. Cl. 235—181 **11 Claims**

6. Apparatus which comprises:

a. a body of semiconductor having a major surface coated by a

dielectric layer which is coated with a piezoelectric layer, the thickness of the dielectric being such that an acoustic wave propagating along the surface undergoes nonlinear acoustoelectric interaction with the semiconductor;

b. an array of electrodes for producing in the piezoelectric layer a pattern of stored electrical charges which varies in a first direction in response to a corresponding pattern of voltages applied to the electrodes;



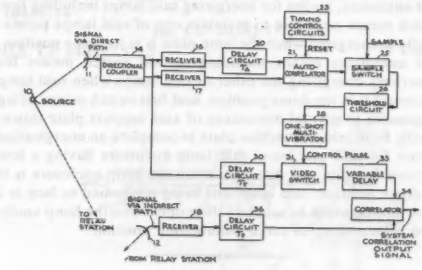
c. means for launching a pair of acoustic waves in the film, one of the waves propagating in the first direction and the other of the waves propagating in the opposite direction, said waves mutually interacting with the semiconductor, whereby an electrical response is generated by the semiconductor which as a function of time is a functional representation of the pattern depending upon the envelopes and frequencies of the acoustic waves.

3,982,114

SIGNAL PROCESSING SYSTEM

William R. Hook, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Aug. 28, 1961, Ser. No. 136,141
Int. Cl.² G06F *15/34*
U.S. Cl. 235—181 **12 Claims**



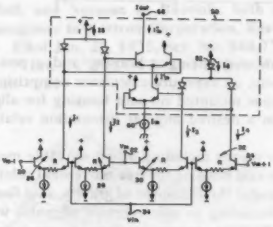
1. A correlation system for two complex multifrequency input signals which may contain relatively strong narrow band components including the combination of: auto-correlator means responsive to one of the input signals, the auto-correlator means dividing the one input signal into two channels and including delay means in one of the channels for introducing a fixed relative timing displacement between the two signals, threshold means coupled to the auto-correlator means for indicating when the auto-correlation output signal exceeds a selected amplitude, first and second delay means each responsive to a different one of the input signals and introducing like delays thereto, gating means coupled to at least one of the delay means and controllably responsive to the threshold means, and correlator means coupled to said delay means and said gating means for correlating the two input signals therefrom.

3,982,115

ELECTRONICALLY PROGRAMMABLE FUNCTION GENERATOR

Einar Oddbjorn Traa, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 31, 1975, Ser. No. 545,962
Int. Cl.² G06G *7/26*
U.S. Cl. 235—197 **4 Claims**



1. An electronically programmable function generator, comprising:

means including a voltage comparator for generating at least two currents, said currents having a ratio which is the same ratio of voltages applied to said means to generate said currents; and

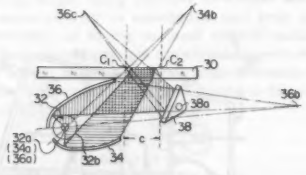
means for combining the ratio of said currents to proportion a reference current as to said ratio of voltages, said proportion being a piecewise linear function.

3,982,116

SLIT ILLUMINATION SYSTEM FOR COPYING MACHINE

Nobuo Sakuma, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1975, Ser. No. 602,045
Claims priority, application Japan, Aug. 6, 1974, 49-89974
Int. Cl.² G03B *15/02, 27/54*
U.S. Cl. 240—1.3 **8 Claims**



1. A slit illumination system, comprising:

an elongated light source having an axis arranged parallel to a plane of the slit;

a first cylindrical mirror spaced farther from said plane than the light source and having an axis parallel to said axis of the light source, the first cylindrical mirror being arranged to reflect light from the light source into the slit;

a second cylindrical mirror spaced between said plane and the light source and having an axis parallel to said axis of the light source, the second cylindrical mirror being arranged to reflect light from the light source generally parallel to said plane; and

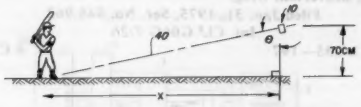
a third mirror arranged to reflect the light reflected from the second cylindrical mirror into the slit.

3,982,117

ELECTRONIC FLASH UNIT FOR CAMERAS

Frank W. Betlejewski, Elgin, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 16, 1974, Ser. No. 532,876
Int. Cl.² G03B 15/02
U.S. Cl. 240—1.3 14 Claims



1. In a flash unit having a housing and a power source mounted therein, an exposure calculator comprising:

sighting means mounted on said housing for aligning said housing in a desired angular orientation relative to the ground;

an indicator means including a first movable member supported on said housing for free movement relative to said housing under the influence of gravity, said first movable member including an index portion alignable with indicia on the housing representative of aperture settings, whereby the angular orientation of the housing caused by aiming the flash unit at an object by means of said sighting means serves to move said index relative to said indicia to indicate the proper aperture setting; and

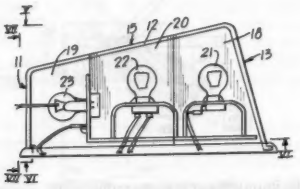
actuating means operatively associated with said first movable member for selectively restraining movement thereof, said actuating means being mounted on said housing and movable between a first position wherein the first movable member is free to move under the influence of gravity and a second position wherein the first movable member is restrained and held in its assumed orientation so that the proper aperture setting can be determined by the relative positioning of said index portion and said indicia.

3,982,118

VEHICLE OUTSIDE LIGHT FIXTURE

Vaughn Thomas, East Orange, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 24, 1975, Ser. No. 552,120
Int. Cl.² B60Q 1/32
U.S. Cl. 240—7.1 R 2 Claims



1. An outside light fixture for a motor vehicle having rear fenders, said light fixture comprising

a housing having a front, rear, top, two sides, a front translucent part of a first color extending around the front and front areas of the sides and top of the housing, a rear translucent colorless part extending around the rear and rear areas of the sides and top of the housing and an intermediate translucent part of a second color different from the first extending around the sides and top between the front and rear parts, said housing being mounted on a rear fender with the front part up and the rear part down; and

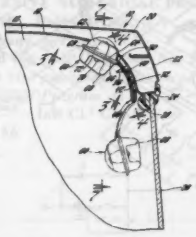
a plurality of lamps in the housing each in the area of a corresponding one of the front, intermediate and rear parts.

3,982,119

COMBINATION DOME AND CARGO LAMP

Peter J. Aluzzo, St. Clair Shores; Charles G. Gibson, Warren, and Albert T. Olson, West Bloomfield, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1975, Ser. No. 570,078
Int. Cl.² B60Q 1/24
U.S. Cl. 240—7.25 2 Claims



1. A combination dome and cargo lamp assembly for the selective illumination of a passenger compartment and cargo area of a vehicle comprising: a connection plate adapted to be secured to the passenger compartment interior having a latch finger formed on one edge portion thereof, hinge means formed on said connection plate on an edge portion thereof opposite to that of said latch finger, a support plate having one edge connected to said hinge means for pivotal movement of said support plate between dome and cargo illumination positions, coacting means on said latch finger and said support plate for retaining said support plate in juxtaposed position with respect to said connection plate when in its dome illumination position, a lamp enclosure fixedly secured to said support plate and movable therewith for pivotal movement with respect to said connection plate between the dome and cargo illumination position, first and second lamps located within said enclosure, means for energizing said lamps including first switch means operative to maintain one of said lamps permanently deenergized when the lamp plate is in its dome position, said energizing means including second switch means for selectively energizing the other of said lamps when said lamp enclosure is in the dome position, said first switch means being responsive to pivotal movement of said support plate downwardly from said connection plate to complete an energization circuit for said one lamp, said lamp enclosure having a lens thereon faced in one direction when the lamp enclosure is in its dome position, said lamp lens being positioned to face in a direction opposite to said one direction when the lamp enclosure is located in its cargo illumination position.

3,982,120

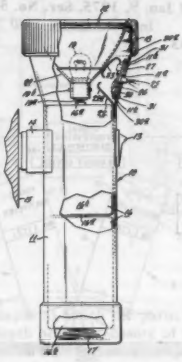
FLASHLIGHT

Richard R. Wynn, 1891 Cleveland Ave., Abington, Pa. 19001

Continuation-in-part of Ser. No. 480,038, June 17, 1974. This application Apr. 7, 1975, Ser. No. 564,781
Int. Cl.² F21L 7/00, 9/00
U.S. Cl. 240—10.6 R 13 Claims

1. In a lantern including a casing adapted to contain an electrical power supply for providing a voltage output of at least a predetermined level, lamp means providing a primary source of illumination for projecting a beam of light of one intensity level, said primary illumination source means having an electrical collector ring spaced from the inside of the casing, means removably mounting said lamp means and collector ring in said casing, and a switch for connecting said collec-

tor ring and lamp means to said power supply, the improvement comprising: a light-emitting diode providing a secondary source of illumination carried by said casing, and circuit means contained by said casing for connecting said power supply to said light-emitting diode to cause said light-emitting diode to emit light of an intensity level substantially lower than the intensity level of said primary illumination source when



said voltage is above said predetermined level, said circuit means including an electrical contact releasably engaging said collector ring upon movement of said collector ring inwardly of said casing toward said contact, whereby said light-emitting diode can be energized to emit light to facilitate location of the lantern in the dark when the primary source of illumination is off and said light-emitting diode can be de-energized upon outward movement of said collector ring.

3,982,121

HEADLAMP TILTING SYSTEM IN A MOTOR VEHICLE

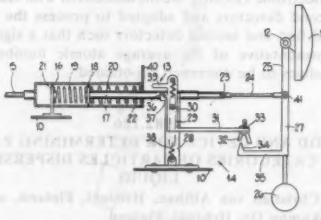
Frederick Raymond Patrick Martin, Kent, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Mar. 5, 1975, Ser. No. 555,714

Claims priority, application United Kingdom, Mar. 8, 1974, 10455/74

Int. Cl.² B60Q *1/10*

U.S. Cl. 240—7.1 LJ **5 Claims**



1. In a motor vehicle having a body, wheels on which said body is mounted and a headlamp mounted for tilting movement on said body, a headlamp tilting system comprising a headlamp tilting mechanism, and a headlamp securing mechanism which is arranged to override said headlamp tilting mechanism and which is normally de-activated to permit said headlamp tilting mechanism to tilt said headlamp, said headlamp tilting mechanism including an element which is normally maintained in tension and which is movable in response to variations in the attitude of said vehicle body relative to said wheels caused by variations in the load carried by said vehicle body, and a member disposed in a part of said headlamp tilting mechanism which connects said element with said headlamp, said member being arranged to activate said headlamp securing mechanism when it moves into a predetermined position, said member being biassed towards said predetermined position but being held against movement into said predetermined position by the tension in said element whereby, when a loss of tension occurs in said element, said member moves into its said predetermined position under the action of its bias to activate said headlamp securing mechanism which is arranged to limit tilting movement of said headlamp.

3,982,122

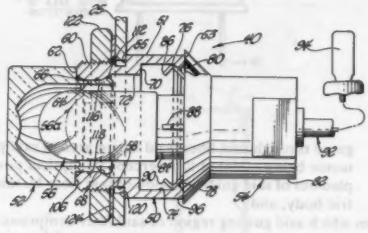
LAMP ASSEMBLY

Dale L. Bull, and Norman A. Rautiola, both of Reed City, Mich., assignors to Nartron Corporation, Reed City, Mich.

Filed Jan. 28, 1975, Ser. No. 544,773

Int. Cl.² F21V *17/00*; **F21Q** *3/00*

U.S. Cl. 240—152 **14 Claims**



1. A lamp assembly, comprising body means, said body means being adapted to be supported by associated support means, a first open end formed in said body means, a second open end formed in said body means, clearance passage means formed through said body means and operatively interconnecting said first and second open ends, lens means operatively connected to said body means as to be supported and carried thereby effectively closing said first open end, first detent-like latching means effective for detachably securing said lens means to said body means, and said second open end being adapted to have operatively connected thereto bulb socket means whereby bulb means carried by said socket means extends into said clearance passage means and upon energization emit light against said lens means, said first detent-like latching means being effective to enable said lens means to be removed from or attached to said body means without the necessity of having to cause relative motion as between said body means and said associated support means, and said bulb socket means also being disconnectable from said body means without the necessity of having to disconnect said lens means from said body means.

3,982,123

OPTICAL FIBER POWER TAPS

James Emanuel Goell, Roanoke SW., Va.; Tingye Li, Rumson, and Willis Martin Muska, Little Silver, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 11, 1974, Ser. No. 522,577

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

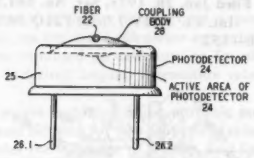
Int. Cl.² G02B *5/14*

U.S. Cl. 250—227 **6 Claims**

1. An arrangement for tapping optical power from an intermediate portion of an optical fiber waveguide without requiring that the fiber be terminated or broken, said fiber including a guiding region in which the optical power is essentially confined, and including a medium surrounding said guiding region, said arrangement being characterized by:

a body of dielectric material disposed in a coupling relationship to an intermediate length of said fiber, said body having an index of refraction which is approximately equal to or greater than the index of refraction of the medium surrounding said guiding region of said fiber and is selected to couple only a minor portion of the optical power propagating in said fiber waveguide guiding region toward a surface of said dielectric body laterally offset from said guiding region;

a photodetector contacting said laterally offset surface of said dielectric body and including an active area responsive to the wavelength of the optical signal to be propa-



gated through said fiber, said active area of said photodetector being oriented to intercept the optical power coupled out of said guiding region of said fiber by said dielectric body; and

in which said guiding region of said fiber comprises an inner core formed of a low optical loss material, said medium surrounding the guiding region comprising an outer cladding of lower refractive index than that of said inner core; and

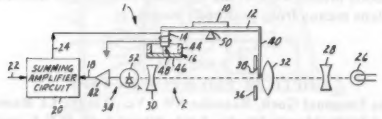
said dielectric body has an index of refraction greater than about 0.8 times the index of refraction of said outer cladding of said fiber.

3,982,124

ELECTRO-OPTICAL FEEDBACK SIGNAL PRODUCING APPARATUS

David J. Schoon, Marine on St. Croix, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 466,975, May 6, 1974, Pat. No. 3,919,545.
This application Oct. 8, 1975, Ser. No. 620,635
Int. Cl.² H01J 3/14
U.S. Cl. 250—237 R **11 Claims**



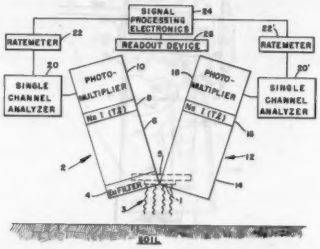
1. Electro-optical feedback signal producing apparatus for use in a control apparatus including: a light means for providing a uniform light flux distribution, a light to electric transducer having an output at which the feedback signal is provided, a light shutter positioned with respect to said light means for receiving said uniform light flux distribution and operatively responsive to the operation of the control apparatus for controlling the passage of light via said shutter in accordance with the operation of the control apparatus and light control means positioned with respect to said light means and said light shutter for converging at said light to electric transducer the light flux presented at said light shutter.

3,982,125

METHOD AND APPARATUS FOR PROVIDING HEIGHT VARIATION COMPENSATION IN CERTAIN NUCLEAR GAUGING APPLICATIONS INCLUDING NUCLEAR MINE DETECTION

Frederick L. Roder, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 9, 1975, Ser. No. 539,883
Int. Cl.² G01V 5/00
U.S. Cl. 250—253 **3 Claims**



1. A photon backscatter nuclear gauging system which enables compensation for variation in system placement comprising:

a photon radiation source having a monenergetic output and adapted such that a medium to be discerned is irradiated by said source when said source is disposed substantially at a selected distance therefrom;

first and second collimated detector means disposed in selected relation with respect said source, each of said detector means having a respective selected orientation with respect said medium to be discerned and each detector means adapted to detect photon backscatter reflected from said medium;

a photon energy discriminator means of the K edge filter variety, said photon energy discrimination means disposed between said first detector means and said medium to be discerned and adapted to filter photon backscatter impinging upon said first detector;

and electronic circuitry means associated with said first and second detectors and adapted to process the output of said first and second detectors such that a signal output representative of the average atomic number of said medium to be discerned is obtained.

3,982,126

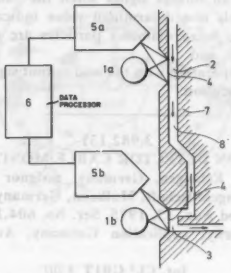
METHOD AND DEVICE FOR DETERMINING PARTICLE SIZE CATEGORIES OF PARTICLES DISPERSED IN A LIQUID

Georg Christian von Alfthan, Helsinki, Finland, assignor to Outokumpu Oy, Helsinki, Finland

Filed Mar. 5, 1974, Ser. No. 448,383
Int. Cl.² G01N 23/20
U.S. Cl. 250—272 **6 Claims**

1. A method of determining the mean size of particles dispersed in a liquid which comprises causing a sample of the liquid containing such particles to flow at a steady rate through an elongated straight flow channel having a uniform cross section and maintaining said flow undisturbed for a sufficient distance along said channel for the establishment of a uniform flow velocity distribution over the cross section of the liquid taken perpendicular to the direction of flow at a measuring point to produce a strong flow velocity gradient in the immediate vicinity of a boundary of said channel at said

measuring point and thereby obtain a distribution of particles in said vicinity in which relatively smaller ones of said particles tend to be nearer the said boundary than relatively coarser ones of said particles, passing X-ray radiation from an X-ray source into said boundary area of the channel, taking a measurement of the fluorescent radiation from said area to determine the average depth at which the particles move through the channel, said depth being a measure of the particle mean size and taking a second fluorescent radiation measurement at a reference point at which the distribution of said particles is different from the distribution at said first mentioned measurement point.



3,982,127

METHOD AND APPARATUS FOR DISPLAYING THE INTERNAL STRUCTURE OF AN OBJECT

Werner Hartmann, Berkheim; Hans-Joachim Queisser; Gregor Markewitz, both of Stuttgart; Ulli Rettenmaier, Reichenbach; Gunter Sprater, Stuttgart, and Rüdiger Kniep, Hilden, all of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Goettingen, Germany

Filed July 14, 1975, Ser. No. 595,588

Claims priority, application Germany, July 17, 1974, 2434391; Mar. 19, 1975, 2512103; Jan. 31, 1975, 2503986

Int. Cl.² G01N *21/34, 23/00*

U.S. Cl. 250—273 **28 Claims**

1. A method of displaying an image of the internal structure of an object which comprises:

a. exposing said object to a primary beam of radiation sufficient to generate emission of a secondary beam of radiation from said object;

b. intercepting said secondary beam by a luminescent screen responsive to said secondary beam to emit a visible image of said object;

c. optically magnifying said image;

d. receiving the magnified image on the photosensitive surface of a television camera;

e. scanning said surface; and

f. producing an electronically enlarged visual image of the image on said scanned surface,

1. the resolving power of said screen being greater than the resolving power of said surface.

3,982,128

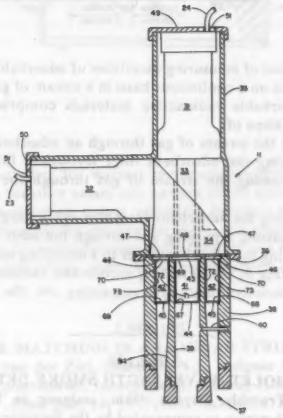
DUAL CRYSTAL SCINTILLATION PROBE

Mark W. Groch, Mount Prospect, and Frank R. Whitehead, Arlington Heights, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Mar. 17, 1975, Ser. No. 559,227

Int. Cl.² G01T *1/20*

U.S. Cl. 250—363 S **15 Claims**



1. A scintillation probe for detecting and measuring radiation comprising transducer means having a central radiation receiving element from which associated signals are generated in response to radiation incident thereon, a peripheral radiation receiving element encircling said central radiation receiving element and from which associated signals are generated in response to radiation incident thereon which signals are distinguishable from signals associated with said central radiation receiving element, tabulating means for separately tabulating the signals associated with said central and peripheral radiation receiving elements, and collimating means defining a generally conical spatial region of acceptance centered on a surface of said central radiation receiving element and further defining a cylindrical absorption region of space coaxial with respect to the aforesaid conical region wherein radiation emanating from said conical region and directed at said central radiation receiving element is not absorbed by said collimating means and radiation emanating from said cylindrical region and directed at said peripheral radiation receiving element is absorbed by said collimating means.

3,982,129

METHOD AND MEANS OF MONITORING THE EFFLUENT FROM NUCLEAR FACILITIES

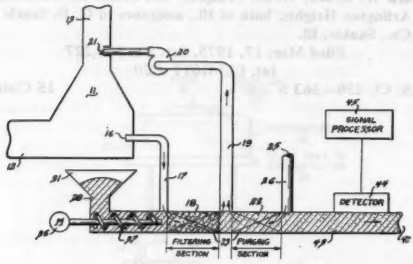
Kenneth R. Lattin, and Gerald L. Erickson, both of Richland, Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 22, 1974, Ser. No. 526,190

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.[2] G01T *1/20*

U.S. Cl. 250—364 **8 Claims**



1. A method of measuring quantities of adsorbable radioactive materials on a continuous basis in a stream of gas containing nonadsorbable radioactive materials comprising in sequence the steps of:

a. passing the stream of gas through an adsorbent filter;

b. conveying the adsorbent filter through a filter section while passing the stream of gas through the adsorbent filter;

c. conveying the adsorbent filter through a purging section while passing a purging gas through the adsorbent filter;

d. conveying the adsorbent filter to a detecting section; and

e. measuring in the detecting section the radiation emitted by radioactive materials remaining on the adsorbent filter.

3,982,130

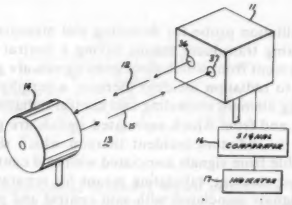
ULTRAVIOLET WAVELENGTH SMOKE DETECTOR

Terry M. Trumble, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 10, 1975, Ser. No. 621,338

Int. Cl.[2] G01N *21/12, 21/26*

U.S. Cl. 250—373 **4 Claims**



1. A system for detecting, at a location, smoke having a determined suspended particulate means diameter size comprising:

a. An ultraviolet source providing a first ultraviolet radiation beam at a first ultraviolet wavelength and a second ultraviolet radiation beam at a second ultraviolet wavelength;

b. means for directing said first and said second ultraviolet beams successively to traverse the said location;

c. means for detecting the respective signal levels of the said first and the said second beams after they have traversed the said location, and providing a signal proportional to each of the respective signal levels of each beam;

d. means responsive to the said signal level of each beam for providing an output signal when the ratio of the said signal levels is a determined value indicative that said particulate mean diameter particles are present in the said beams; and

e. means cooperating with the said output signal for providing an indication.

3,982,131

NEUTRON DETECTOR CABLE MONITORING

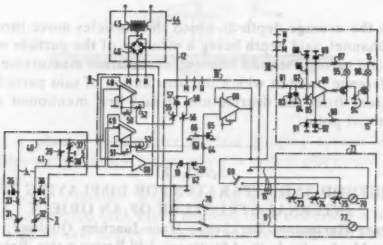
Pierre Haller, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim, Germany

Filed Aug. 13, 1975, Ser. No. 604,115

Claims priority, application Germany, Aug. 20, 1974, 2439954

Int. Cl.[2] G01T *3/00*

U.S. Cl. 250—390 **4 Claims**



1. A neutron detector arrangement comprising a neutron detector of the (n, e) process type, and a system comprising an operational current amplifier having an input and an input offset voltage adjustment circuit, a cable containing a conductor and insulation for the conductor, said cable connecting said detector to said input, a source of A-C current, connecting means for connecting said source to said circuit, said amplifier having an output, a cable insulation resistance-limit indicator, and filter means for filtering A-C current from said output and connecting the filtered output to said limit-indicator.

3,982,132

PATIENT RESTRAINING STRAP FOR SCINTIPHOTOGRAPHY

Thomas D. Kay, and John W. Harper, both of San Antonio, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

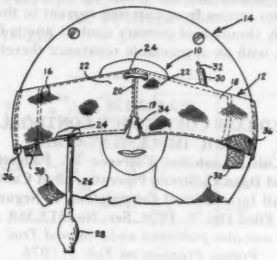
Filed Feb. 13, 1975, Ser. No. 550,110

Int. Cl.[2] G01N *21/00, 23/00*

U.S. Cl. 250—456 **1 Claim**

1. The combination of a patient restraining strap and scintillation camera comprising a plurality of fastening elements secured in preselected locations to said camera, said restraining strap being formed of a body having an elongated configuration, fastening means located on the interior portion of said body for removable and adjustable attachment to said fastening elements on said camera, said body being in the form of a pair of cloth-like bags connected together in side-by-side relationship along the longitudinal dimension of said body, each of said bags containing a resilient expandable bladder therein, a pipe interconnecting said bladders, means connected to one of said bladders for expanding said bladders, means connected to the other of said bladders for deflating

said bladders and a cut-out portion located at the connection of said bags for allowing the nose of a patient to protrude



therethrough whereby said restraining strap, when expanded, comfortably immobilizes against said camera the head of a patient undergoing treatment by said scintillation camera.

3,982,133

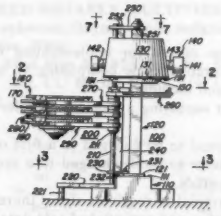
COLLIMATOR CHANGER FOR SCINTILLATION CAMERA

Edward C. Jupa, Berwyn; Raymond L. Meeder, Palos Heights, and Edward K. Richter, Buffalo Grove, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Continuation of Ser. No. 306,703, Nov. 15, 1972, abandoned. This application Jan. 16, 1974, Ser. No. 433,736

Int. Cl.² G21K *1/02*

U.S. Cl. 250—505 **5 Claims**



1. In combination:

a detector support means;

a radiation detector mounted on said detector support means in a vertically mobile manner for selective positioning in one of a plurality of vertically separated collimator changing positions;

a plurality of collimators suitable for radiation imaging and adapted for interchangeable mounting on said detector;

means for securing a selected one of said collimators to said detector to the exclusion of all other of said collimators; and

collimator changing and storage means comprising a single collimator support column positioned proximate to said detector support means, and a plurality of support arms mounted at vertically separated positions on said collimator support column in a laterally rotatable cantilevered manner, each of said support arms being adapted to carry a single one of said collimators and to transport it between a storage position remote from said detector and a collimator changing position.

3,982,134

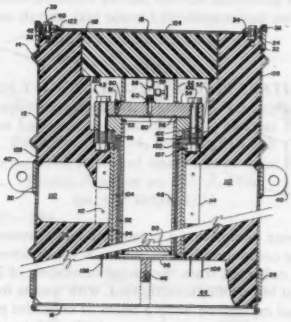
SHIPPING CONTAINER FOR NUCLEAR FUELS

William R. Housholder, 807 Mullins St., Johnson City, Tenn. 37601, and Norman L. Greer, 1409 Central Ave., Elizabethton, Tenn. 37643

Continuation-in-part of Ser. No. 447,320, March 1, 1974, abandoned. This application Sept. 19, 1974, Ser. No. 507,588

Int. Cl.² G21F *1/00*

U.S. Cl. 250—506 **23 Claims**



1. A container for nuclear materials comprising a metal housing, a pressure vessel and gamma shield assembly in said housing, positioning means extending between said housing and said assembly for spacing the same, and insulation essentially filling the space between said assembly and housing, said insulation comprising water beads encapsulated in plastic.

3,982,135

PHASE MATCHING IN A LAMINAR STRUCTURE

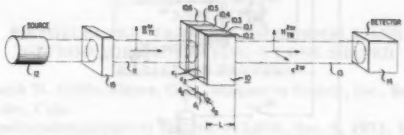
Jan Peter van der Ziel, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 14, 1975, Ser. No. 540,872

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² H02M *5/04*

U.S. Cl. 307—88.3 **16 Claims**

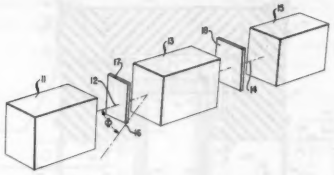


1. A nonlinear optical device comprising a multilayered body including a plurality of pairs of layers of material having sufficiently different refractive indices to substantially cancel dispersion produced when a plane wave optical beam at a fundamental frequency propagates through said layers and parallel thereto, at least one of said layers of each pair comprising a nonlinear material and the thickness of said layers relative to one another being effective to phase match said beam to the second harmonic thereof and being smaller than the wavelength corresponding to said fundamental frequency.

3,982,136
TERNARY FERROELECTRIC FLUORIDE NONLINEAR DEVICES

John George Bergman, Jr., Rumson; Glen Robert Crane, Scotch Plains, and Howard Joseph Guggenheim, Somerville, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 23, 1975, Ser. No. 598,187
Int. Cl.² H02M *5/04*
U.S. Cl. 307—88.3 **4 Claims**

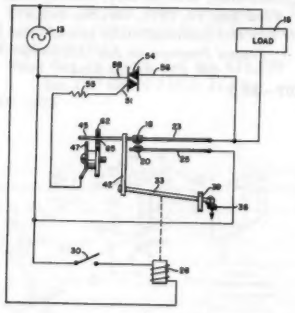


1. A device comprising a crystalline body consisting essentially of the compound $BaXF_4$, where X is a divalent transition metal ion, collected from the group consisting of Zn, Ni, Co, Fe, Mn and Mg or mixtures thereof, with means for introducing into said crystalline body a beam of coherent plane polarized electromagnetic radiation at 1.06 ± 0.1 microns and means for extracting a beam of coherent electromagnetic radiation at 0.53 ± 0.05 micron emitted from said body, the said body being positioned in such a way that the angle between the beam of first frequency and the optic axis of said crystalline body is such that the first beam and second beam are noncritically phase matched within the crystal.

3,982,137
ARC SUPPRESSOR CIRCUIT

John K. Penrod, Bellbrook, Ohio, assignor to Power Management Corporation, Dayton, Ohio

Filed Mar. 27, 1975, Ser. No. 562,809
Int. Cl.² H02H *7/22*
U.S. Cl. 307—136 **11 Claims**



1. In a switching circuit comprising current carrying primary contact points and auxiliary contact points means, semiconductor means having power conducting terminals connected across said primary contact points and gate terminal means connected to said auxiliary contact point means for providing gating signals to said semiconductor means, the method of closing said primary contact points while power is applied without arcing by temporarily providing gating signals to said semiconductor means comprising the steps of:

first closing said auxiliary contact point means to provide gating signals to said semiconductor means,

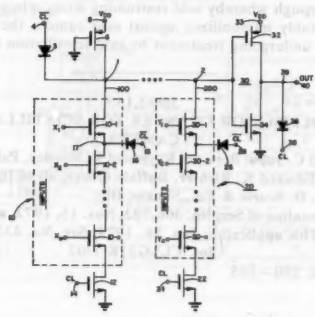
closing said primary contact points, and

thereafter opening said auxiliary contact point means while said primary contact points are closed to remove said gating signals so that said semiconductor means does not continue conducting current thereby to protect said semiconductor means from carrying current to the load continuously should said primary contact points fail to close or close with an appreciable resistance therebetween.

3,982,138
HIGH SPEED-LOW COST, CLOCK CONTROLLED CMOS LOGIC IMPLEMENTATION

James A. Luisi, Anaheim; Clarence W. Padgett, Fountain Valley, and Dana C. Street, Placentia, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 9, 1974, Ser. No. 513,368
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl.² H03K *19/08, 19/36*
U.S. Cl. 307—205 **10 Claims**



1. A synchronous circuit for implementing functions of logic having an operating cycle comprising an active and a recovery segment and including,

source means for supplying a plurality of reference potentials,

a data node adapted to be charged to a first of said reference potentials or to be discharged to a second of said reference potentials,

a data output terminal to receive a signal thereat representative of the reference potential of said data node,

at least one semiconductor device connected between said data node and said reference potential source means,

current source means connected to said data node to charge said data node to said first reference potential, and

timing signal means connected to said at least one semiconductor device to enable said data node to be discharged through a conduction path of said at least one semiconductor device and to said second reference potential during the active segment of the circuit operating cycle,

said current source means including a source of constant current and a source of periodic current to charge said data node to said first reference potential,

said source of constant current connected to said reference potential source means to charge said data node to said first reference potential during the recovery segment of the circuit operating cycle to thereby compensate for residual leakage current from said at least one semiconductor device, and

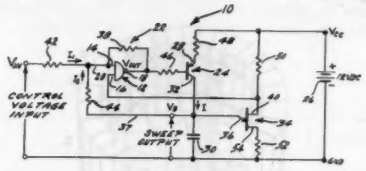
said source of periodic current connected to said timing signal means to periodically charge said data node to said first reference potential during the recovery segment of the circuit operating cycle.

3,982,139

EXPONENTIAL SWEEP MULTIVIBRATOR

Stephen R. Troy, 104-20 89th Ave., Richmond Hill, N.Y. 11418

Filed Apr. 21, 1975, Ser. No. 570,064
Int. Cl.² H03K 4/08
U.S. Cl. 307—228 11 Claims



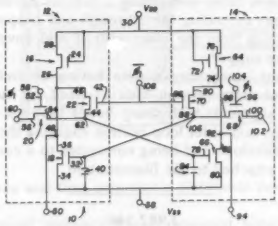
1. an exponential sweep multivibrator comprising a digital device having first and second inputs and an output, means electrically connected to said digital device for accepting a control voltage and directing said control voltage to said first input of said digital device, a feedback circuit electrically connected between said first input and said output of said digital device, means electrically connected to said output of said digital device for converting said digital device output voltage into a current, capacitor electrically connected to said voltage converting means, a DC source electrically connected to said voltage converting means, a voltage sensitive switching means, said switching means having at least two terminals, one of said terminals being electrically connected to said capacitor and said second input of said digital device and the other of said terminals being electrically connected to said first input of said digital device whereby said multivibrator is capable of producing an output waveshape which is an essentially exponential function with respect to time.

3,982,140

HIGH SPEED BISTABLE MULTIVIBRATOR CIRCUIT

George C. Lockwood, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed May 9, 1975, Ser. No. 575,913
Int. Cl.² H03K 3/286, 3/353, 5/20
U.S. Cl. 307—279 12 Claims



1. In a bistable circuit having two symmetrical circuit sections and having a first stable state when one section is conducting and a second stable state when the other section is conducting, the improvement comprising:

a source of reference voltage,

a first voltage storage means connected to said first section to cause it to initially conduct at a rate proportional to its stored voltage,

means for periodically applying the reference voltage to said first voltage storage means during a first predetermined period and for isolating said source of reference voltage from said first storage means during a second predetermined period,

a source of information voltage,

a second voltage storage means connected to said second section to cause it to initially conduct at a rate proportional to its stored voltage,

means for periodically applying the information voltage to said second storage means during said first predetermined period and for isolating said source of information voltage from said second storage means during said second predetermined period, and

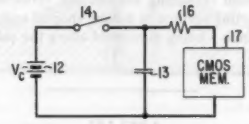
means for deactivating both said circuit sections during said first predetermined period and for activating said circuit sections during said second predetermined period.

3,982,141

VOLTAGE MAINTENANCE APPARATUS

John Alexander Copeland, III, Watchung, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 7, 1974, Ser. No. 512,849
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl.² H03K 1/02
U.S. Cl. 307—296 4 Claims



1. In combination:

a semiconductor memory having a resistance-voltage characteristic which is similar to MOS memories;

said memory being adapted to be connected in parallel with a d-c power supply for applying to the memory a voltage V_i;

said memory being capable of storing electrical data provided the applied voltage is a minimum value V_f;

means for temporarily maintaining an applied voltage between V_f and V_i in the event of accidental disconnection of the power supply comprising a capacitor in parallel with the memory and the power supply;

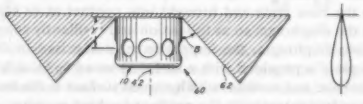
and means for increasing the time during which the applied voltage can be temporarily maintained above V_f comprising a resistor which is other than any internal resistance of the capacitor, connected between the capacitor and the memory, the resistor having a resistance R substantially defined by the Equation $R \leq 0.4\ (V_{ci} - V_f)/I_f$ where I_f is the capacitor discharge current at voltage V_f and V_{ci} is the initial voltage across the capacitor.

3,982,142

PIEZOELECTRIC TRANSDUCER ASSEMBLY AND METHOD FOR GENERATING A CONE SHAPED RADIATION PATTERN

Ralph W. Goble, Eldora, Colo., assignor to Sontrix, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 412,884, Nov. 5, 1973. This application May 20, 1974, Ser. No. 471,280
Int. Cl.² H01L 41/04
U.S. Cl. 310—8.2 23 Claims



1. A piezoelectric transducer assembly for generating a radiation pattern of acoustical energy having a cone shaped

cross section relative to a selected axis, said assembly comprising:

a resonant chamber having side walls and closed ends and a selected resonant frequency, said chamber being positioned with its longitudinal axis parallel with the side walls and defining the selected axis of said assembly, said chamber having a plurality of spaced apart sound transmitting apertures defined in its side walls about its longitudinal axis, the centerpoints of said apertures defining a plane substantially perpendicular to said selected axis;

piezoelectric transducer means mounted within said chamber for generating therein along said selected axis a spherical radiation pattern of acoustical energy at the resonant frequency of said chamber whereby similar radiation patterns of said acoustical radiation are emitted from each of said apertures along their center axes; and,

means defining a conical reflecting surface positioned at an acute angle β to the longitudinal axis of the chamber to receive and reflect acoustical waves radiating from the centerpoints of said apertures towards said reflecting surface, said conical reflecting surface being spaced apart from the plane of the centerpoints of said apertures a predetermined distance y at which acoustical waves at said resonant frequency radiating from said apertures towards said reflecting surface are reflected away from said reflecting surface in a cone shaped radiation pattern, said distance y being measured along the side walls of the chamber.

3,982,143

PIEZOELECTRIC DIAPHRAGM ELECTRO-ACOUSTIC TRANSDUCER

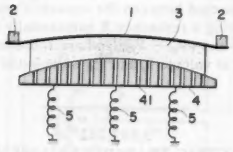
Masahiko Tamura, and Takashi Oyaba, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 12, 1975, Ser. No. 549,341

Claims priority, application Japan, Feb. 18, 1974, 49-19528[U]

Int. Cl.² H01L *41/08*

U.S. Cl. 310—9.1 **8 Claims**



1. In a piezoelectric electro-acoustic transducer comprising a support means of a stiff material, a flexible diaphragm having a piezoelectric property and supported at its edge portions by the support means, a base plate of a stiff material, and a resilient backing member compressedly covered at one side with the base plate and brought into contact at its other side with the diaphragm so as to tension and resiliently support the flexible diaphragm, the improvement comprised in that said base plate is provided with a surface curved to be at least one of concave and convex, which curved surface is the base plate surface in contact with the resilient backing member, at least one of the resilient backing and tension of said flexible diaphragm varying locally thereacross due to said curvature of said base plate surface.

3,982,144

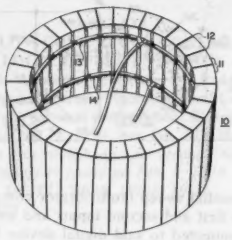
DIRECTIONAL LOW-FREQUENCY RING HYDROPHONE

Peter H. Rogers, Reston, and Joseph F. Zalesak, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 23, 1974, Ser. No. 500,206

Int. Cl.² H01L *41/04*

U.S. Cl. 310—9.6 **6 Claims**



1. A method of low frequency operation of a small sized free-flooded circumferentially polarized ring-type hydrophone which comprises:

operating said hydrophone at an operating range which is more than two octaves below any of its axisymmetric, mechanical resonant frequency.

3,982,145

FILAMENT SUPPORTS FOR TUBULAR ELECTRIC INCANDESCENT LAMPS

Jerome M. Liptow, South Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 24, 1975, Ser. No. 552,102

Int. Cl.² H01J *1/16, 17/50;* H01K *1/18*

U.S. Cl. 313—274 **5 Claims**

1. An electric lamp comprising a tubular envelope and a coiled filament extending therethrough and supported intermediate its ends from the inner wall of said envelope by at least one wire support,

said support comprising a wire having an outer convex polygonal loop portion characterized by substantially straight segments with sharp bends between successive segments, said outer loop portion engaging the inner wall of said envelope and being connected to a central coiled portion attached to the filament coil.

3,982,146

FLUID COOLED COMMUTATED ELECTRIC MOTOR

Stephen G. Hokky, North Olmsted, Ohio, assignor to Airborne Manufacturing Company, Elyria, Ohio

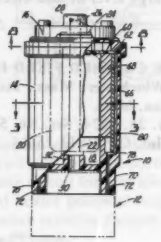
Continuation-in-part of Ser. No. 341,539, March 15, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,174

Int. Cl.² H02K *5/00*

U.S. Cl. 310—89 **7 Claims**

1. In an electric motor having a housing and cover means forming a fluid tight enclosure, a commutator within said enclosure, an improved brush assembly comprising, a pair of brushes, said cover means slidably mounting said brushes within said enclosure with one end of each brush in engagement with said commutator, first and second sets of mounting means and reaction means carried by said cover means within said enclosure, at least one of said means of each set being

formed of low resistance current carrying material and extending externally of said cover means, a pair of torsion springs each formed of a low electrical resistance homogenous current carrying material, each torsion spring having first and second opposite end portions and a central coiled portion, the central coiled portion of each of said springs being wrappingly engaged around one of said mounting means within said enclosure, the first end portion of each of said springs engaging



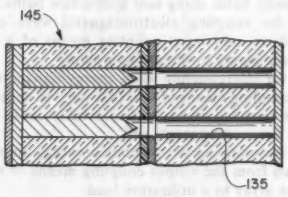
one of said reaction means, the second end portion of each of said springs engaging the end of one of the brushes opposite the end thereof engaging the commutator, each of said springs acting as the sole current carrier to its respective brush, whereby each spring acts both as a biasing element and sole current carrying element thereby providing brushes free of separate electrical connections and means to direct cooling fluid from within said enclosure to the region of said brushes and said springs.

3,982,147

ELECTRIC DEVICE FOR PROCESSING SIGNALS IN THREE DIMENSIONS

Charles Redman, 2020 Huntington Drive, Los Cruces, N. Mex. 88001

Filed Mar. 7, 1975, Ser. No. 556,525
Int. Cl.² H01J *1/30, 1/34, 29/04, 29/50*
U.S. Cl. 313—309 **2 Claims**



1. An area and time processing electronic device comprising:

an electrical insulator having opposed input and output faces;

a planar control grid, intermediate the input and output faces and substantially parallel thereto being integral with and (bisecting) traversing the electrical insulator, the combination of electrical insulator and control grid providing a plurality of parallel evacuated chambers which are continuous between the input and output faces;

a plurality of conducting fibers occupying the parallel evacuated chambers extending from the input face and terminating short of the control grid;

detection means including an input face seal, electrically coupled to the input face, for detecting energy incident to the input face, said detection means comprising a semiconductor layer deposited on the input face so as to seal the evacuated chambers and a thin film conductor deposited on the semiconductor layer so as to sandwich the semiconductor between the input face and the thin film conductor; and

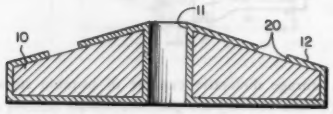
output means, including an output face seal, electrically coupled to the output face, said output means further including a second plurality of conducting fibers occupying the evacuated chambers extending from the output face and terminating substantially short of the control grid so that the length of the remaining evacuated space is greater than the length of the conducting fibers.

3,982,148

HEAT RADIATING COATING AND METHOD OF MANUFACTURE THEREOF

Richard B. Kaplan, Hollywood; Sebastian Gonnella, Arleta, and Walter M. Abrams, Van Nuys, all of Calif., assignors to Ultramet, Pacoima, Calif.

Filed May 7, 1975, Ser. No. 570,281
Int. Cl.² H01J *35/08*
U.S. Cl. 313—330 **5 Claims**



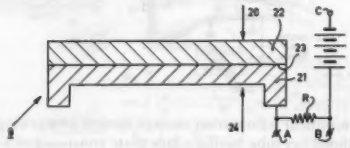
1. A heat radiating coating for a refractory core, said coating consisting of a layer of rhenium having a thickness of no less than about 25 microns and a heat radiating emissivity on the order of 0.9, said coating covering at least a portion of the core and consisting of a multiplicity of needle-like radiation-reflecting elements disposed adjacent to each other and at such steep angles that outgoing radiation is reflected until substantially all heat is released from the core.

3,982,149

CAMERA TUBE HAVING A TARGET WITH HETEROJUNCTION

Jan Dieleman, and Arthur Marie Eugene Hoeberechts, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 17, 1974, Ser. No. 515,455
Claims priority, application Netherlands, Oct. 27, 1973, 7314804
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.² H01J *29/45, 31/38*
U.S. Cl. 313—366 **13 Claims**



1. A camera tube comprising an evacuated envelope and within the envelope an electron source, a target to be scanned by an electron beam emerging from said source, said target comprising a radiation-receiving silicon layer which on the side to be scanned by the electron beam has a chalcogen-containing layer which forms a hetero junction with the silicon layer, said chalcogen-containing layer comprising gallium.

3,982,150

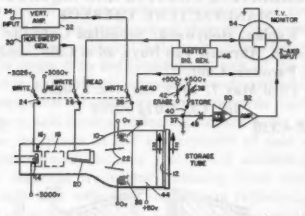
BISTABLE STORAGE TUBE HAVING STORAGE DIELECTRIC OF PHOSPHOR PARTICLES COATED WITH SECONDARY EMISSIVE MATERIAL

Ralph A. Mossman, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 37,378, May 7, 1960, Pat. No. 3,862,450, which is a continuation of Ser. No. 618,129, Feb. 23, 1967, abandoned. This application Apr. 8, 1974, Ser. No. 458,947

Int. Cl.² H01J *29/39, 29/10*

U.S. Cl. 313—398 **5 Claims**



1. A storage dielectric capable of bistable storage of a charge image formed thereon, comprising:

a plurality of separate particles of phosphor material; and

secondary emissive material coated on at least part of the surface of said phosphor particles with substantially all of the secondary emissive material in said storage dielectric being bonded to the phosphor particles only on the surface of said phosphor particles and substantially uniformly distributed throughout the storage dielectric, said secondary emissive material having a higher secondary electron emission efficiency than said phosphor material.

3,982,151

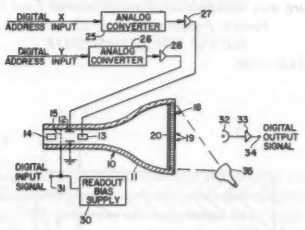
OPTICAL INFORMATION STORAGE SYSTEM

Bruno F. Ludovici, Owego, N.Y., and Gerhard K. Megla, Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 677,185, Oct. 23, 1967. This application Nov. 19, 1973, Ser. No. 416,976

Int. Cl.² H01J *29/12, 29/89*

U.S. Cl. 313—465 **4 Claims**



1. An optical information storage system comprising

a cathode ray tube having a face plate consisting of a plurality of light-conducting optical fibers, each fiber having a core of photochromic glass of selected refractive index and a cladding on said core of light transmitting material of relatively lower refractive index, said fibers being arranged in side-by-side parallel contacting relation to each other in a hermetically sealed bundle,

a layer of phosphor adjacent said face plate within said cathode ray tube,

means for directing an electron beam on said layer of phosphor,

means for changing the energy level of said electron beam,

output means disposed on that side of said face plate opposite said phosphor layer in light receiving relationship with respect to said face plate for generating an electrical signal that is related to the intensity of the light emerging from the fibers of said plate, and

means for applying a digital input signal to said means for changing the energy level of said electron beam.

3,982,152

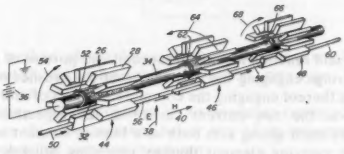
CASCADE CROSSED FIELD DEVICE

William A. Smith, Winchester, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 25, 1974, Ser. No. 526,651

Int. Cl.² H01J *25/34*

U.S. Cl. 315—3.6 **6 Claims**



1. A crossed-field traveling wave electron interaction device comprising:

an envelope;

a plurality of axially aligned electrically coupled energy amplifier stages in a cascade array disposed within said envelope;

each of said cascaded stages comprising a slow wave structure for propagating electromagnetic wave energy having input and output energy coupling means; and

plural means for generating and directing electrons along a path adjacent to each said slow wave structure to interact in energy exchanging relation with said propagating wave energy;

means for providing mutually perpendicular electric and magnetic fields along said interaction paths;

means for coupling electromagnetic wave energy drive signals to said input coupling means of a first of said cascade stages to initiate operation;

means for intercoupling wave energy signals from the output coupling means of said first stage to subsequent stage input coupling means to sequentially cause operation of each succeeding stage; and

means for coupling the combined energy amplified output signals from the output coupling means of the last stage in the array to a utilization load.

3,982,153

RAPID WARM-UP HEATER CIRCUIT

Glen Alden Burdick, Waterloo, and Edward Izydor Zmuda, Seneca Falls, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 12, 1975, Ser. No. 631,231

Int. Cl.² H01F *13/00*

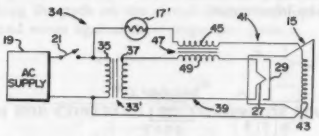
U.S. Cl. 315—8 **6 Claims**

1. In a color display device employing a cathode ray tube and utilizing a degaussing circuit including a temperature responsive resistive element, an improvement in the circuit means for energizing heater means associated with thermionic emission means within said tube to effect rapid warm-up of said heater upon initiation of an operating mode, the improvement in said circuit means comprising:

an AC power supply having switching means to control the AC output thereof, said degaussing circuit being con-

nected to said AC output and energized through said switching means;

a first transformer having a primary winding activated by the closing of said switching means, and a secondary winding series connected to said heater element to provide a circuit for energizing said heater; and



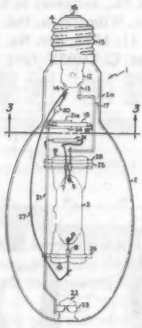
an inductive means having one portion series connected in said heater circuit and a related portion series connected to said degaussing circuit for providing an induced transitory increase of heater potential responsive to said temperature responsive resistive element upon the activation of said switching means.

3,982,154

ARC DISCHARGE LAMP CONSTRUCTION FOR STARTER ELECTRODE VOLTAGE DOUBLING

Dale K. Mize, Mentor, and William H. Lake, Novelty, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,506
Int. Cl.² H01J *17/34*
U.S. Cl. 315—51 **10 Claims**



1. An arc discharge lamp comprising:

a vitreous arc tube containing an ionizable medium and having two main electrodes plus a starter electrode sealed therein;

an outer envelope enclosing said arc tube and having a pair of inleads sealed thereinto;

a voltage doubling circuit comprising a diode and a capacitor within said outer envelope connected in series across said inleads, said capacitor being of rigid construction with two stiff leads, one of said stiff leads being fastened to one of said inleads;

a mount frame including said capacitor as a structural component, said mount frame having a portion fastened to the other stiff lead and supporting said arc tube;

said diode being poled to develop a positive potential on said frame portion whereby to oppose positive ion electrolysis through the walls of said arc tube;

connections from said inleads to the main electrodes in the arc tube;

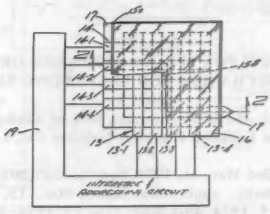
and means connecting said mount frame portion to said starter electrode in order to apply a positive voltage thereto to facilitate starting.

3,982,155

SATURATED PHOTON CONDITIONING OF MULTIPLE GASEOUS DISCHARGE PANEL

Michael E. Fein, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 18, 1972, Ser. No. 254,648
Int. Cl.² H05B *37/00*
U.S. Cl. 315—169 TV **3 Claims**



1. In a process for conditioning the gaseous discharge medium of a plurality of to be addressed display cells for uniform operation at reduced voltage in the operation of a multiple gas discharge display/memory panel comprised of a matrix of display cells formed by opposing dielectric charge storage surfaces and electrode arrays, at least one cell being a pilot cell in the on-state for the photon conditioning of the other matrix display cells,

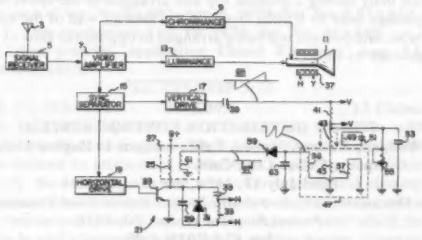
the improvement wherein the sustaining voltage applied to each pilot cell is sufficiently greater in amplitude than the sustaining voltage applied to the other display cells so as to provide a conditioning photon flux sufficient to reduce the required write voltage of the other display cells to a minimum level V_{100} such that the provision of additional conditioning photons would not significantly further reduce the amplitude of the required writing pulse.

3,982,156

TOP-BOTTOM PIN-CUSHION CORRECTION CIRCUIT

Tex K. Monroe, Batavia, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 14, 1975, Ser. No. 622,134
Int. Cl.² H01J *29/70, 29/76*
U.S. Cl. 315—400 **9 Claims**



1. In a cathode ray tube scanning system having a deflection yoke with horizontal and vertical deflection windings coupled to sources of deflection current at horizontal and vertical scan rates and said deflection yoke associated with a cathode ray tube, a top-bottom pin-cushion correction circuit comprising:

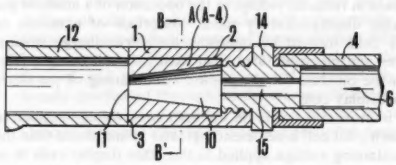
a source of flyback pulse signals at the horizontal scan rate;
a saturable reactor having a control winding and an output winding;
means for coupling said control winding of said saturable reactor to said source of flyback pulse signals, said means including a unidirectional conduction device and a resonating capacitor for effecting a resonant circuit with said control winding;
means for coupling said output winding of said saturable reactor to said source of deflection current at a vertical scan rate; and
means for tuning said output winding of said saturable reactor to said horizontal scan rate; said means including a parallel connected capacitor and impedance shunting said output winding.

3,982,157

EQUIPMENT FOR SPOUTING POWDER OR FLUID HAVING MECHANISM FOR PREVENTING ELECTRIC SHOCK

Kanae Azuma, and Minoru Ochiai, both of Ashikaga, Japan, assignors to Kohkoku Chemical Industry Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1975, Ser. No. 557,303
Claims priority, application Japan, Mar. 15, 1974, 49-29805; June 5, 1974, 49-63685; June 12, 1974, 49-69040
Int. Cl.² H05F *1/02*
U.S. Cl. 317—2 J **18 Claims**



1. Apparatus for spouting powder or fluid including means for preventing operational problems caused by static electricity without grounding devices, comprising a spout tube embodying a nozzle and defining a flow passage through which said powder or fluid flows, said powder or fluid being spouted from said nozzle, a transport tube through which said powder or fluid moves to said spout tube, a main body which contains said powder or fluid and which is connected to said transport tube and a projecting electricity-eliminating member composed of a material having volume resistivity of $10^8\Omega$-cm or less, which is placed in said flow passage facing the flow layer of said flowing powder or fluid and which is electrostaticaly connected to said main body, said projecting electricity-eliminating member being configured in the form of a pyramidal body having a pointed top and arranged in the spout tube passage held by a pillar fixed on the interior wall of the spout tube, said pointed top being arranged to oppose the flow of the powder or fluid.

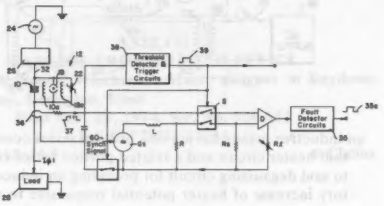
3,982,158

POWER DISTRIBUTION CONTROL SYSTEM

Wolfgang Knauer, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed July 15, 1974, Ser. No. 488,634
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.² H02H *3/00*
U.S. Cl. 317—9 R **18 Claims**

12. The method of controlling ac electric power transmission to provide fault protection comprising the following steps:
establishing a threshold for early detection of potential faults along a power transmission path;
sensing the line signal in the transmission path and producing a threshold signal when it is beyond the established threshold;
producing a reference wave in synchronism with the transmission path;
reducing the impedance on the reference wave upon threshold signalling to produce a simulated fault wave signal representing the minimum fault value at which the path is to be interrupted;



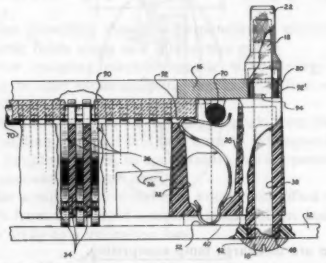
comparing the line signal and the simulated fault wave in a monitoring time period less than a time period for substantial build-up of power resulting from a fault condition to provide a fault signal for line signal beyond the simulated fault wave signal; and
interrupting power transmission in response to the fault signal while maintaining the transmission path closed in the absence of a fault signal.

3,982,159

LEADLESS PACKAGE RETAINING FRAME

Richard Kay Dennis, Etters, and Edward Leal Hadden, Mechanicsburg, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 11, 1974, Ser. No. 522,925
Int. Cl.² H05K *1/04*
U.S. Cl. 317—101 CC **11 Claims**



1. A leadless package assembly comprising a rectangular retaining frame having four side members formed of dielectric material and including a plurality of contact cavities, each cavity having an opening adjacent the top of the frame and an opening adjacent the bottom of the frame and a cam surface adjacent the top frame opening; a resilient conductive contact in each cavity, each contact including a first nose exposed through said top frame opening and a second nose exposed through said bottom frame opening, an interconnecting portion joining said noses, such portion including a cam follower segment adjacent said first nose engagable with said cam surface and a bowed spring member extending from said cam follower segment to said second nose; said rectangular frame including mounting means for use in securing the rectangular frame on a circuit board or like member having contact pads adjacent said lower frame openings for forming electrical connections with said second noses; whereby positioning of a

leadless package on the top of the frame with contacts on the package in alignment with the top frame openings for forming electrical connections with said first noses and movement of said package toward said openings engages the contact pads on the package with the first noses, and forces such noses into their respective cavities and moves said cam follower segments along the cam surfaces to wipe such noses along the package pads, stress said bowed portions, wipe said second noses along the pads on the circuit board and force the first and second noses against their respective pads.

3,982,160

SYSTEM FOR CONTROLLING TENSION OF MAGNETIC TAPE

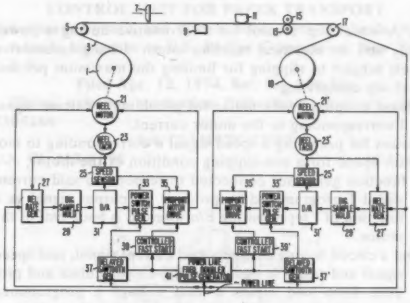
Arthur Marvin Goldschmidt, Moorestown; William Arnold Dischert, Jobstown, and Joseph Richard West, Haddonfield, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 12, 1975, Ser. No. 557,534

Claims priority, application United Kingdom, Mar. 14, 1974, 11430/74

Int. Cl.² B65H *59/38*

U.S. Cl. 318—7 **16 Claims**



1. In a system for magnetically recording signals on a moving web, apparatus for maintaining tension in said web comprising:

means for propelling said web along a path;

a first reel for said web;

a first motor associated with said first reel;

a source of alternating energizing voltage for said first motor;

first means for producing a first signal representative of the rotational velocity of said first reel;

second means for producing a second signal representative of the linear velocity of said web;

a first servo loop responsive to said first and second signals for controlling said reel comprising:

means for supplying a periodically varying reference signal in timed relation with said alternating energizing voltage;

signal rate control means coupled to said first and second means for generating an output signal representative of the rotational speed of said web reel in relation to the linear web speed; and

control means responsive to said reference signal and said output signal of said signal rate control means for variably energizing said first motor to maintain substantially uniform tension in said moving web.

3,982,161

TIME-RATIO CONTROL HAVING BIDIRECTIONAL SPEED POTENTIOMETER

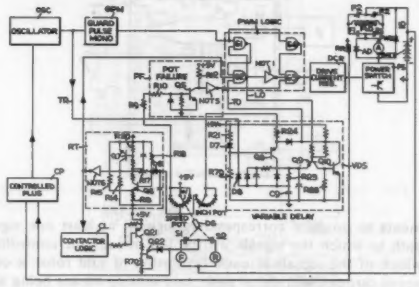
Michael H. Grace, Griffith, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 3, 1974, Ser. No. 502,973

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² H02P *7/08*

U.S. Cl. 318—257 **1 Claim**



1. In a vehicle driven by a d.c. traction motor energized by unidirectional pulses of current supplied from a battery through a semiconductor power switch and having forward and reverse contactors which control the direction of said motor to propel said vehicle in the forward and reverse directions respectively, a time-ratio control for selectively varying the duty cycle of said pulses to thereby regulate the speed of said motor including a variable delay RC timing circuit having a timing capacitor in series with a bidirectional speed potentiometer, said speed potentiometer having a resistance element provided with a midtap and a movable wiper adapted to slidably engage said resistance element to vary the resistance of said speed potentiometer in series with said timing capacitor and thereby regulate the time duration and duty cycle of said pulses, said RC timing circuit being in series with the resistance of said speed potentiometer between said wiper and said midtap, whereby movement of said wiper in either direction from said midtap increases the resistance in said timing circuit and thereby varies the time duration of said pulses, and direction control means for completing respective energizing circuits to said forward and reverse contactors when said wiper is moved in opposite directions away from said midtap.

3,982,162

CENTRIFUGES

David William Olliffe, 86 Forester Road, Southgate, Crawley, Sussex, England

Division of Ser. No. 61,602, Aug. 6, 1970, Pat. No. 3,832,614. This application Apr. 19, 1974, Ser. No. 462,540

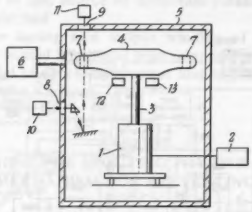
Claims priority, application United Kingdom, Aug. 13, 1969, 40446/69

Int. Cl.² H02P *5/16*

U.S. Cl. 318—313 **13 Claims**

1. In a centrifuge operable with a variety of rotors, with each rotor there being associated a maximum speed of rotation defined by an element carried by a respective one of said rotors, the centrifuge having means for sensing said element to prevent increase in the speed of rotation of said rotor when the maximum speed is reached, the improvement which resides in said element being a surface portion having, along an annular path centered on the axis of said rotor, a length defining the maximum speed and a property along its length which distinguishes said surface portion from the remainder of said annular path; said sensing means being arranged to sense said property of the surface portion without contact with said rotor to produce a signal having a time duration which is a function

of said length; and means for sensing when the time duration of the signal has fallen to a predetermined value, wherein said rotor is an analytical rotor with at least two compartments to receive samples and carrying distinct portions corresponding to respective compartments in addition to said surface portion which also defines a predetermined angular position of said rotor, the centrifuge comprising a compartment examining system for sensing radiation passed through said compartments to produce corresponding signals; at least one signal path to which the signals will be fed; means for controlling which of the signals in each revolution of said rotor is conveyed through said signal path; said sensing means being also arranged to sense said distinct portions without contact with said rotor and operable in conjunction with said controlling means so that said signal path will carry a signal corresponding to just one of said compartments, and so that said one compartment will be defined.



3,982,163
TEMPERATURE SENSITIVE ELECTRONIC SWITCHING ARRANGEMENTS

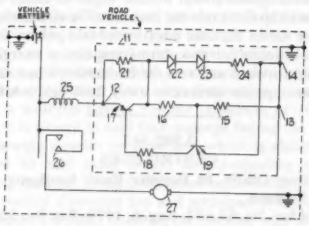
William Frank Hill, Stafford, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Dec. 3, 1973, Ser. No. 420,897

Claims priority, application United Kingdom, Dec. 2, 1972, 55798/72

Int. Cl.² G05D 23/30

U.S. Cl. 318—473 **13 Claims**



1. A temperature sensitive electronic switching device for an externally powered DC load circuit automatically operable in response to a change in temperature to switch between a first state of high resistance and a second state of low resistance, said switching device thereby controlling current flow through said DC load circuit, said switching device comprising in combination a casing, a single pair of terminals on said casing for connection in said DC load circuit, and a switching circuit means within said casing defining a series circuit between said terminal pair, said series circuit including a first resistor, a first normally non-conductive transistor disposed across said resistor, a second normally non-conductive transistor regeneratively coupled to said first transistor, and a biasing means for said second transistor including a positive temperature coefficient thermistor, said biasing means automatically turning on said second transistor upon a rise in temperature above a preselected value to regeneratively switch on said first transistor and thereby provide a low resistance current path between said terminal pair by-passing said resistor, said biasing means further automatically serving to turn off said second transistor upon a subsequent decrease in temperature below said preselected value to switch off said first transistor and thereby provide a high resistance current path between said terminal pair through said resistor.

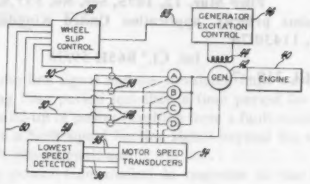
3,982,164
LOCOMOTIVE WHEEL SLIP CONTROL

Alfred P. de Buhr, Downers Grove, and Bruce R. Meyer, Western Springs, both of Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 18, 1974, Ser. No. 534,078

Int. Cl.² H02P 5/50

U.S. Cl. 318—52 **5 Claims**



1. A wheel slip control for a locomotive having a power supply and an electrical traction motor driving locomotive wheels subject to slipping for limiting the maximum percent wheel slip comprising

means coupled to the motor for providing a current signal I corresponding to the motor current,

means for providing a speed signal n corresponding to motor speed for a non-slipping condition of the motor,

a function generator connected to respond to said current signal I programmed to produce an output signal as a function of I representing E/*n* where E is back emf of the motor,

and a circuit having as inputs said current signal, said speed signal and said E/*n* signal operative to calculate and produce from said inputs a limit voltage a programmed amount in excess of $V = E + IR$ where V is the voltage of the motor for a non-slipping condition and R is motor resistance, and the programmed amount in excess of V represents a desired percent slip, and

means responsive to said limit voltage for limiting the maximum voltage supplied to the motor to a value corresponding to said limit voltage thereby establishing a maximum percent slip of wheels driven by the motor.

3,982,165
APPARATUS FOR DIGITIZING AND PLOTTING

Leonard G. Rich, West Hartford, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed Sept. 10, 1974, Ser. No. 504,844

Int. Cl.² G05B 19/36

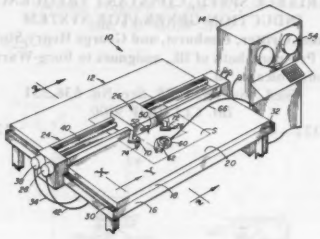
U.S. Cl. 318—568 **17 Claims**

1. In a device having a support table and a carriage translatable by means of a servomotor over an exposed supporting surface defined on the table, the improvement comprising:

a manually movable cursor freely positionable on the exposed supporting surface of the table and having a visible index to identify coordinate locations on the surface;

electromagnetic radiation means carried above the exposed supporting surface of the table on both the carriage and the movable cursor for detecting the positioning of the cursor and carriage relative to one another and producing corresponding relative position signals identifying the location of the index relative to the carriage, the radiation

means being mounted in unobstructing relationship with the visible index of the cursor when viewed from above the supporting surface; and



drive means connected to the support table and the carriage and responsive to the position signals from the electromagnetic radiation means for moving the carriage toward a preselected position relative to the cursor on the exposed supporting surface of the table.

3,982,166

CONTROL UNIT FOR PAPER TRANSPORT

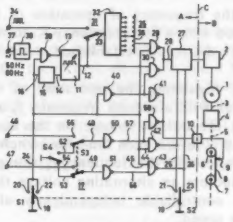
Sebastianus Sijtstra, and Willem Boom, both of Almelo, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 12, 1974, Ser. No. 460,281

Claims priority, application Netherlands, Apr. 16, 1973, 7305266

Int. Cl.² H02K *37/00*

U.S. Cl. 318—696 **10 Claims**



1. A control unit for paper transport in recording instruments energized from a 50 or 60 Hz AC supply source comprising, a controllable oscillator, a motor supply circuit connected to a stepping motor having a drive shaft for driving a paper roller, a paper speed selection switch coupled to the motor supply circuit, a change-over switch for selectively switching the output of the controllable oscillator to the selection switch and directly to the motor supply circuit to provide normal and fast paper transport speeds, respectively, in the normal paper transport position of the switch the oscillator has a frequency of substantially *n* times 300 Hz, where *n* is an integer, means connecting a synchronizing input of the oscillator to the AC supply via a pulse shaper and means including the change-over switch for effectively connecting the oscillator in the fast paper transport position of the change-over switch to a timing circuit, said timing circuit being energized via the change-over switch to produce a time-variable signal for controlling the oscillator frequency from a low value to a high value.

3,982,167

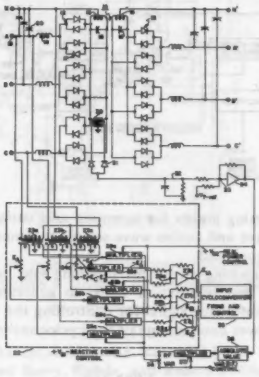
CURRENT CONTROL SYSTEM FOR HIGH FREQUENCY LINK CYCLOCONVERTER

Paul M. Espelage, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed July 31, 1975, Ser. No. 600,879

Int. Cl.² H02M *5/27*

U.S. Cl. 321—61 **14 Claims**



1. A cycloconverter system comprising

a polyphase cycloconverter circuit in cascade with a high frequency resonant tank circuit and having in each phase a series filter inductor connectable to a source of low frequency line voltage,

a cycloconverter control circuit for controlling the in-phase and quadrature components of input line current in each phase and for maintaining the tank voltage within predetermined limits,

said control circuit including a tank voltage feedback circuit for sensing the tank voltage and comparing to a reference voltage to derive a tank voltage error signal, phase and amplitude shifter means for generating per phase cycloconverter reference signals for controlling the real power and in-phase input current component in dependence upon the polarity and magnitude of said tank voltage error signal and for independently controlling the reactive power and quadrature input current component in dependence upon the polarity and magnitude of a reactive power control signal, and firing and control means in effect actuated by said cycloconverter reference signals for controlling said cycloconverter.

3,982,168

PHASE SHIFTER FOR CONTROLLING THE POWER COMPONENTS AND POWER FACTOR OF A CYCLOCONVERTER

Bimal K. Bose, Troy, and Paul M. Espelage, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 26, 1975, Ser. No. 562,338

Int. Cl.² H02M *5/27*

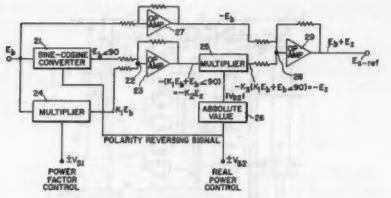
U.S. Cl. 321—69 R **14 Claims**

11. A phase shifter circuit for generating cycloconverter reference signals for independently and linearly controlling the real power and reactive power components of the cycloconverter comprising

converter means for converting input sine wave signals representative of the per phase line voltage to a cosine wave signal of proportional amplitude having a polarity dependent upon the polarity of a real power control signal,

first multiplier means for varying the amplitude and polarity of said input sine wave signals in dependence upon the magnitude and polarity of a reactive power control signal to thereby generate a variable amplitude sine wave signal,

second multiplier means for varying the magnitude of said cosine wave signal in dependence upon the magnitude of said real power control signal to thereby generate a variable amplitude cosine wave signal,



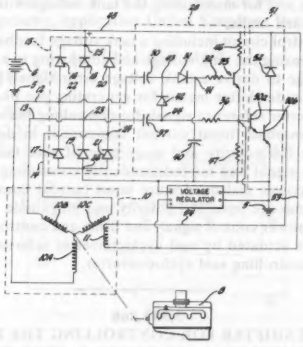
first summing means for summing said variable amplitude sine wave and cosine wave signals to generate a summation signal, and

second summing means for summing said input sine wave signals and summation signal to generate a cycloconverter reference signal for controlling the real and reactive power components of the cycloconverter.

3,982,169
EXCITATION SYSTEM FOR A SELF-EXCITED ALTERNATOR

Donald L. Cummins, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 25, 1975, Ser. No. 607,199
Int. Cl.² H02P 9/08
U.S. Cl. 322—28 **4 Claims**

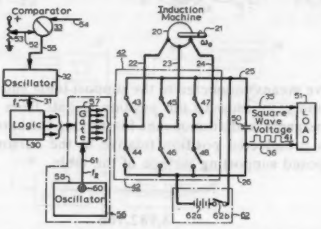


1. An excitation system for a self-excited alternator having a field winding positioned in operative relationship with the output windings thereof comprising in combination with a potential regulator circuit of the type including a transistor switching arrangement effective, when in the electrical circuit closed condition to complete an energizing circuit for the alternator field winding: a capacitor connected in circuit with said alternator output windings in such a manner that it is charged in a first direction during selected half cycles and in a second direction during the other half cycles of a selected phase of the alternator alternating current output potential; and means responsive to the charge upon said capacitor and the potential of said selected half cycles of said alternator output potential acting in series aiding relationship for triggering said transistor switching arrangement to the electrical circuit closed condition to complete an energizing circuit for said alternator field winding.

3,982,170
VARIABLE SPEED, CONSTANT FREQUENCY INDUCTION GENERATOR SYSTEM

David James Gritter, Elmhurst, and George Henry Studtmann, Mount Prospect, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 28, 1975, Ser. No. 636,331
Int. Cl.² H02P 9/00
U.S. Cl. 322—47 **12 Claims**



1. The method of controlling an a-c voltage generating system in which an induction machine is driven as a generator, comprising the steps of:

exciting the generator from a switching system including a plurality of controllable switches and a pair of bus conductors;

regulating the frequency of operation of the switches in accordance with a first frequency f_1, to regulate the amplitude of a d-c voltage established on the bus conductors; and

additionally regulating the operation of the switches in accordance with a second frequency f_2 and in a pattern such that the output voltage on the bus conductors is effectively reversed each time the switches are operated in accordance with the frequency f_2, thus providing on the bus conductors an alternating voltage the frequency of which is controllable independently of the induction generator speed.

2. An a-c voltage generating system including an induction machine coupled to a switching system having a pair of bus conductors and a plurality of switches, a first logic circuit connected to supply firing pulses to regulate operation of the system switches, and a first oscillator circuit connected to provide timing pulses at a first frequency f_1 for regulating operating of the first logic circuit, characterized in that:

each switch in the switching system is a power switch, capable of passing current in either direction when turned on by a firing pulse and capable of being turned off at any time; and further comprising

a second logic circuit, including a gate circuit coupled between said first logic circuit and said power switches, and a second oscillator circuit, coupled to said gate circuit, the gate circuit being connected to operate as a function of the pulses provided by both the first and second oscillator circuits, to turn on the power switches in the inverter circuit in accordance with the operating frequencies of both the first and second oscillator circuits, to provide a controlled a-c output voltage on the inverter bus conductors.

3,982,171

GATE CURRENT SOURCE

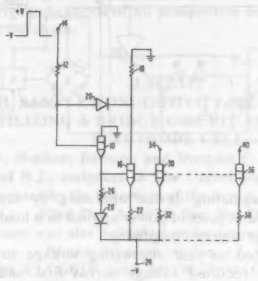
John Edwin Gersbach, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,276

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.[2] G05F *3/08*

U.S. Cl. 323—1 6 Claims



1. A current source comprising

a current reference circuit, including a first transistor having a base electrode and an emitter electrode, a second transistor having a collector electrode, an emitter electrode and a base electrode coupled to the emitter electrode of said first transistor, a non-linear feedback circuit coupled between said collector electrode and the base electrode of said first transistor, an input terminal for receiving a voltage pulse coupled to the base electrode of said first transistor, a voltage supply source terminal and a first impedance coupling said voltage supply source terminal to the emitter electrode of said second transistor, and

a current sink circuit, including an output current terminal, a second impedance and a third transistor having a collector electrode, an emitter electrode and a base electrode coupled to the base electrode of said second transistor, said collector electrode of said third transistor being connected to said output current terminal and said emitter electrode of said third transistor being connected to said voltage supply terminal through said second impedance.

3,982,172

PRECISION CURRENT-SOURCE ARRANGEMENT

Rudy Johan van de Plassche, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

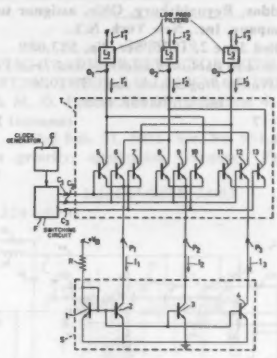
Filed Apr. 16, 1975, Ser. No. 568,726

Claims priority, application Netherlands, Apr. 23, 1974, 7405441

Int. Cl.[2] G05F *1/56*

U.S. Cl. 323—1 12 Claims

1. A precision current source arrangement for producing n accurately identical currents comprising, a multiple current source which supplies *n* approximately identical currents, a coupling circuit with *n* input terminals coupled to said multiple current source and *n* output terminals, means including a clock generator for coupling a periodic control signal to the coupling circuit in a cyclically permuting fashion, said coupling circuit including means responsive to the periodic control signal for selectively interconnecting said *n* input terminals with said *n* output terminals so as to establish a connection pattern between the *n* input terminals and the *n* output terminals such that each of the output terminals within a constant cycle time, which is defined by the control signal, is consecutively coupled to each of the input terminals during *n*



identical time intervals and during each time interval each of the output terminals is coupled to a separate input terminal.

3,982,173

AC-DC VOLTAGE REGULATOR

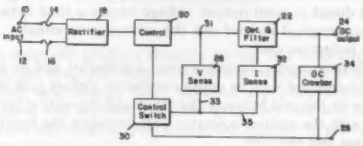
Clyde Raymond Berry, Goleta, and Robert J. Cinzori, Santa Barbara, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 10, 1974, Ser. No. 459,811

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.[2] G05F *1/56, 1/64*

U.S. Cl. 323—17 9 Claims



1. An efficient voltage regulation network for converting an unregulated AC input voltage into a regulated DC output voltage across a load, said network comprising:

a. a series pass control element for conducting current a given portion of each cycle of AC input voltage coupled thereto,

b. means connected to the output of said control element for detecting and filtering the output voltage thereof and providing a DC ripple voltage, said detection means disconnecting said control element from said load once each cycle of AC input voltage applied to said control element and preventing said control element from turning on more than one each cycle of AC input voltage applied thereto,

c. means connected to the output of said control element for sensing the changes in voltage thereat and for generating a control potential at a control node, and

d. means coupled between said control node and the input of said series pass control element and responsive to the voltage generated at control node for controlling the time during each cycle of AC input voltage that said series pass control element is conducting current to an output load, whereby said control element provides the required amount of output current for a varying load on said regulator and the latter, in turn, determines the varying level of voltage at the output of said series pass control element.

3,982,174

SWITCHING VOLTAGE REGULATOR WITH LOW RFI NOISE

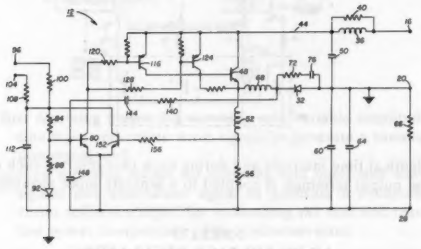
Harry L. Maddox, Reynoldsburg, Ohio, assignor to Western Electric Company, Inc., New York, N.Y.

Filed June 2, 1975, Ser. No. 583,089

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.[2] G05F *1/56*

U.S. Cl. 323—17 12 Claims



8. In a switching voltage regulator for receiving an unregulated direct current input voltage between an input terminal and a reference terminal thereof and for generating a regulated direct current output voltage across a load between an output terminal thereof and the reference terminal;

an induction coil;

a first transistor, having a base, a collector and an emitter, connected with its emitter-collector circuit path in series with the coil between the input and the output terminals, with the emitter-collector path between the input terminal and the coil;

a diode, connected between the reference terminal and a point between the series connected first transistor and coil, and poled to be nonconductive when the first transistor is conductive;

means for applying a control signal to the base of the first transistor to cyclically drive the first transistor (a) from full conduction to cutoff to interrupt a current flow between the input and the output terminals and through the first transistor and the coil to induce a voltage in the coil of a polarity to forward bias the diode and establish a current path between the reference terminal and the output terminal and through the diode and the coil (b) from cutoff to partial conduction at a controlled rate to again establish the current path between the input terminal and the output terminal and to reduce the current flow through the diode at a controlled rate, and (c) from partial conduction to full conduction at a more rapid rate when the current flow through the diode has been reduced to a predetermined value, to generate the regulated direct current output voltage across the load between the output terminal and the reference terminal, and

means for sensing the value of the current flow to the output terminal and for varying the value of the control signal, when the current flow reaches a predetermined maximum value, to control the conduction of the first transistor to limit the current flow to the output terminal to the predetermined maximum value.

3,982,175

POWER REGULATING DEVICE

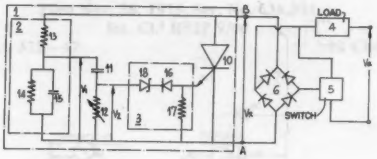
Maurice Sauvanet, Fontenay-le-Fleury, France, assignor to Silec-Semi-Conducteurs, Paris, France

Filed Sept. 25, 1974, Ser. No. 509,162

Claims priority, application France, Sept. 26, 1973, 73.34562

Int. Cl.[2] G05F *5/00*

U.S. Cl. 323—18 11 Claims



1. A power regulating device operating by suppressing periodically full half cycles of power applied to a load from an alternating voltage source comprising:

means connected to said alternating voltage source for producing a rectified voltage across first and second terminals,

a controllable semiconductor element including an anode, a cathode and a control electrode of the type which is triggered by the current sinking from its control electrode, said anode and cathode being connected to said first and second terminals, respectively,

an RC circuit comprising at least a resistor and a capacitor connected in series, said capacitor being connected to be charged from said first terminal and said resistor being connected to said second terminal, and

a two electrode threshold device connected between said control electrode and the junction of said resistor and said capacitor, whereby the controllable semi-conductor element is periodically conducting for one-half-cycles of the alternating voltage source.

3,982,176

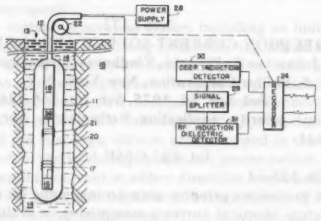
COMBINATION RADIO FREQUENCY DIELECTRIC AND CONVENTIONAL INDUCTION LOGGING SYSTEM

Richard A. Meador, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 11, 1974, Ser. No. 531,562

Int. Cl.[2] G01V *3/10, 3/18*

U.S. Cl. 324—6 13 Claims



1. A method for determining the characteristics of earth formations in the vicinity of a well borehole, comprising the steps of:

generating in a well borehole a radio frequency electromagnetic field in the frequency range of 10 megahertz to 60 megahertz;

detecting at a spaced distance from the location of generation of said radio frequency electromagnetic field the total field amplitude of said radio frequency field, said

amplitude being a function of the conductivity and permittivity of the earth formations in the vicinity of the borehole and generating a signal representative thereof;

normalizing said total field signal with respect to air;

simultaneously with said generating and detecting steps, generating a conventional induction log measurement of the conductivity of the earth formations in the vicinity of the borehole; and

combining said induction log conductivity measurement and said normalized radio frequency total field signal according to a predetermined functional relationship to derive indications of oil prospective zones penetrated by the borehole.

3,982,177

SOIL SAMPLE CONDUCTIVITY MEASUREMENT UTILIZING A BRIDGE CIRCUIT AND PLURAL ELECTRODE CELL

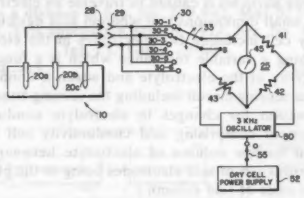
John W. Walker, Belmar, and Douglas C. Pearce, Sea Girt, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 8, 1970, Ser. No. 79,099

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² G01V *3/06*; **G01N** *27/04*; **G01R** *27/00*

U.S. Cl. 324—13 **2 Claims**



2. Apparatus for determining the conductivity of a soil sample comprising a calibrated fluid-tight cell filled with a sample of soil to be analyzed, a pair of electrodes chemically inert to salts and acids within said soil, said electrodes projecting into a soil containing portion within said cell and connectable externally of said cell, a resistance measuring bridge circuit, and means for connecting said soil electrodes into a portion of said bridge circuit, said bridge circuit including a current supply of unknown magnitude and a frequency between 1.5 kHz and 10 kHz.

3,982,178

METHOD OF DETERMINING ADEQUACY OF SUBSTRATE MEMORY WIRE DURING THE PLATING PROCESS

Marden H. Seavey, Jr., Westford; Joseph M. Wyman, Framingham, and Emil Toledo, Newton, all of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 29, 1975, Ser. No. 545,249

Int. Cl.² G01R *33/12*

U.S. Cl. 324—34 R **8 Claims**

1. A method of evaluating memory wire substrates during plating processing to determine adequacy for memory wire applications comprising:

plating reference memory wire substrates of known good quality in a sequence of selected plating process solutions and performing selected tests after the processing step of each solution;

determining the acceptable ranges of properties at each selected test is performed;

plating new memory wire substrates in a like sequence of solutions; and

testing said new wire substrates after selected plating steps to determine those substrates having properties lying within said acceptable ranges.

3,982,179

MAGNETIC GRADIENT DETECTOR WITH MEANS FOR ADJUSTING THE PARALLELISM OF THE SENSORS

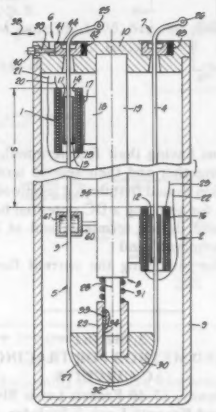
Friedrich M. O. Forster, Grathwohlstrasse 4, D-7410 Reutlingen, Germany

Filed Feb. 21, 1975, Ser. No. 551,640

Claims priority, application Germany, Feb. 22, 1974, 2408547

Int. Cl.² G01R *33/02*

U.S. Cl. 324—43 G **13 Claims**



1. A magnetic gradient detector having two magnetic field sensors, the magnetic axes of which are parallel to an imaginary line, said sensors being installed a predetermined distance from one another along the imaginary line and having respective electrical outputs connected together to provide an electrical signal corresponding to the gradient of the magnetic fields present at the location of the two magnetic field sensors, the improvement comprising:

each magnetic field sensor is connected to a separate wire maintained in axial tension, said wires being arranged parallel to each other and to the imaginary line; and

first and second means respectively connected to said wires for adjustably shifting the wires in planes perpendicular to each other and to the respective wires.

3,982,180

APPARATUS FOR TESTING MULTICONDUCTOR CABLES FOR CONTINUITY, CORRECT CONNECTIONS, AND THE ABSENCE OF SHORT CIRCUITS BETWEEN CONDUCTORS

Henry Edge Vaiden, Winston-Salem, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 20, 1974, Ser. No. 534,767

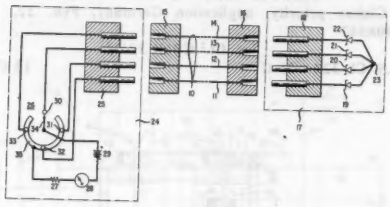
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² G01R *31/02*

U.S. Cl. 324—51 **9 Claims**

5. Apparatus for testing the electrical continuity between terminals on a first device and terminals on a second device where said first device terminals should be connected in a preassigned order to a plurality of conductors and said second device terminals should likewise be connected in a preassigned order to said conductors, said apparatus comprising:

a plurality of first means, each having first and second terminals, each responsive to a first current flowing in a first direction between said terminals to produce a first voltage drop which is unique to said first voltage drops of all other of said first means and each responsive to a second current flowing in a second direction between said terminals to produce a second voltage drop where all of said second voltage drops of said first means are substantially equal,



said first means having their first terminals all electrically connected together and their second terminals arranged for connection to said first device terminals, respectively,

second means for applying a DC potential between any one of said second device terminals and at least one of its remaining terminals, and

third means for indicating the current flowing from said source.

3,982,181

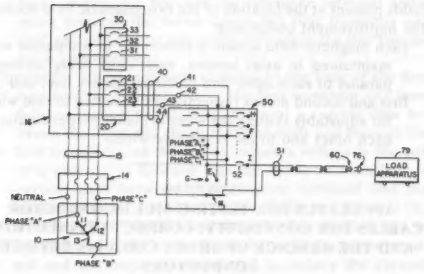
APPARATUS AND METHOD FOR TRACING ENERGIZED AC CIRCUITS

John Thomas Ferony, 17-40 Francis Lewis Blvd., Whitestone, N.Y. 11357, and Kenneth Louis Schmieder, 64-82 58 Road, Maspeth, N.Y. 11378

Filed May 21, 1975, Ser. No. 579,427

Int. Cl.² G01R *19/16*

U.S. Cl. 324—66 **15 Claims**



1. For use in an AC power distribution network having a plurality of live AC circuits each including a circuit protective device, a system for identifying a particular one of said plurality of live circuits and comprising:

load means adapted to be coupled to said particular one of said plurality of live circuits for introducing a DC current in said circuit; and

test means adapted to be coupled across the circuit protective device of each of said plurality of live circuits for detecting said DC current in said particular one of said circuits thereby to indentify said particular circuit.

3,982,182

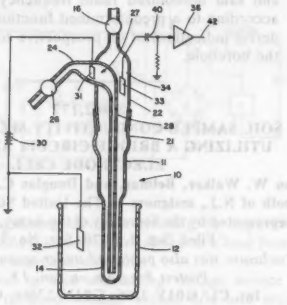
CONDUCTIVITY CELL FOR PARTICLE STUDY DEVICE

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 387,548, Aug. 13, 1973. This application Jan. 21, 1975, Ser. No. 543,011

Int. Cl.² G01N *27/00*

U.S. Cl. 324—71 CP **15 Claims**



1. In a particle study device wherein a liquid electrolyte containing particles is caused to traverse an electrical sensing zone of small dimensions and wherein said device has a conductivity cell including two electrodes in the electrolyte for establishing a variable resistance which is a function of the conductivity of the electrolyte and which is connected to an electrical sensing circuit including the sensing zone to provide compensation for changes in electrolyte conductivity, the improvement comprising said conductivity cell including a long and narrow column of electrolyte between said electrodes with each of said electrodes being in the electrolyte at opposite ends of said column.

3,982,183

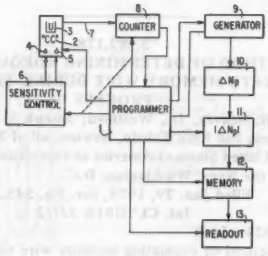
PARTICLE SIZING APPARATUS

Claude Jean Collineau, Margency, and Jacques Andre Pontigny, Montmorency, both of France, assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Feb. 20, 1975, Ser. No. 551,328

Int. Cl.² G01N *27/00*

U.S. Cl. 324—71 CP **14 Claims**



1. Apparatus for obtaining mass or volume distribution of a sample of particles having various sizes suspended in a fluid, said apparatus comprising:

A. detecting means for sequentially producing a series of electrical pulse trains of one pulse per particle, each pulse representing the volume or mass of said particle, said detecting means including means for establishing a particle size threshold which is sequentially variable such that appearance of said pulses for each successive value of

said threshold is contingent upon said particles having sizes exceeding said threshold value,

B. sequential counting means connected to said detecting means for receiving and counting the pulses in said pulse trains and furnishing in synchronism with variations of said threshold a series of output signals, comprising a series of cascaded binary counting units including a multi-pole switch having a plurality of studs, the output of each of said binary counting units being connected to a stud of the multi-pole switch, and means for actuating said multi-pole switch in synchronism with the variation of said threshold,

C. measuring means for measuring the time between the start of each counting and appearance of the corresponding output signals, such as to obtain signals having durations representing numbers of counted particles for the respective threshold values,

D. differential calculating means for sequentially counting values representing the difference between each pair of successive durations thus obtained, and

E. display means for successively displaying said differential values.

3,982,184

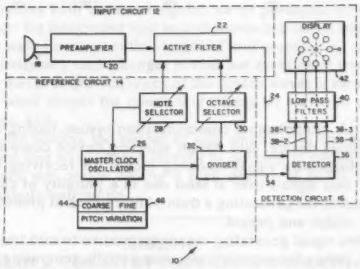
PHASE DIFFERENT DETECTOR AND DISPLAY

Albert E. Sanderson, Carlisle, Mass., assignor to Inventronics, Inc., Carlisle, Mass.

Continuation of Ser. No. 399,920, Sept. 24, 1973, abandoned, which is a division of Ser. No. 249,942, May 3, 1972, abandoned. This application May 6, 1974, Ser. No. 467,221

Int. Cl.² G01R *25/00*

U.S. Cl. 324—83 **15 Claims**



1. A phase difference display for continuously displaying the phase difference between a binary input signal at an unknown frequency and a binary clock signal at a known frequency, said phase difference display comprising:

A. first input means for receiving the binary input signal of unknown frequency,

B. second input means for receiving the binary clock signal of a known frequency, and

C. comparison and display circuit means including:

i. means responsive to the binary clock signal for producing a plurality of binary spaced phase reference signals at a known frequency, said reference signals including a first phase reference signal and a second phase reference signal that is other than a complement of the first phase reference signal,

ii. a phase difference detector including a plurality of logical combination means connected to receive each of the phase reference signals, each of said logical combination means combining, according to a binary logical function, the input signal of unknown frequency from said first input means and a corresponding one of the phase reference signals for transmitting a binary logical output signal which has a duty cycle that varies in accordance with the phase relationship between the input signal from said first input means and the corresponding phase reference signal, and

iii. a plurality of visual display means, each said visual display means being responsive to one of the binary logical output signals for displaying the phase relationship between the input signal from said first input means and the corresponding phase reference signal, said plurality of visual display means providing a continuous display of the direction of change and the rate of change of the phase of the input signal from said first input means.

3,982,185

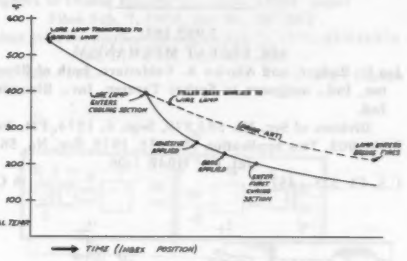
LAMP BASING USING UV CURABLE ADHESIVE

Michael G. Shinn, Memphis, Tenn., and Billy G. Fransen, Opelousas, La., assignors to General Electric Company, Schenectady, N.Y.

Filed June 25, 1975, Ser. No. 590,096

Int. Cl.² H01R *3/00*

U.S. Cl. 339—144 R **8 Claims**



1. A process for joining a base to a wire lamp comprising the steps of:

cooling the seal area of said wire lamp to less than 300°F;

warming said base to a temperature above ambient and below 180°F;

applying an ultraviolet curable adhesive to one of said wire lamp and base;

applying said base to said wire lamp; and

curing said adhesive by irradiation with ultraviolet light to bond said base to said wire lamp.

3,982,186

FM RECEIVER WITH DETECTOR FOR MULTI-PATH RECEPTION

Hiroshi Furuno, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 22, 1975, Ser. No. 570,358

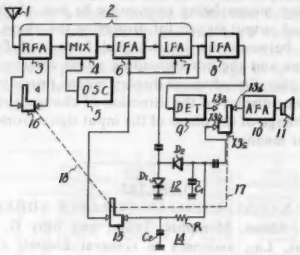
Claims priority, application Japan, May 1, 1974, 49-49180

Int. Cl.² H04B *1/06*

U.S. Cl. 325—344 **7 Claims**

3. In an FM receiver having a receiving circuit comprised of an RF amplifier and an IF amplifier for receiving an FM broadcast signal to which said receiver is selectively tuned, an FM detector coupled to said IF amplifier for converting the received FM signal to a corresponding audio signal, an audio amplifier for amplifying said audio signal, and a loudspeaker coupled to said audio amplifier for producing audible sounds corresponding to the signal amplified by said audio amplifier, the improvement comprising: amplitude detecting means coupled to said receiving circuit for detecting amplitude modulation components in said received FM broadcast signal caused by multi-path reception of said FM broadcast signal, said amplitude detecting means producing relatively low frequency output signals in response to detected amplitude modulation components; and means for selectively applying said corresponding audio signal produced by said FM detector and said low frequency output signals produced by said amplitude

detecting means to said audio amplifier, whereby said loudspeaker produces audible sounds corresponding to said audio



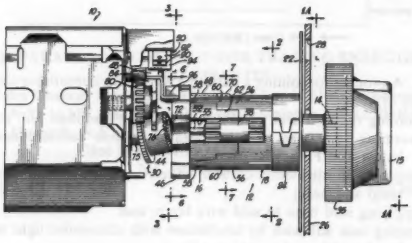
signal, or a characteristic audible sound corresponding to said output signals and indicative of said multi-path reception.

3,982,187

AFC DEFEAT MECHANISM

Joe G. Badger, and Alarico A. Valdettaro, both of Bloomington, Ind., assignors to Sarkes Tarzian, Inc., Bloomington, Ind.

Division of Ser. No. 503,979, Sept. 6, 1974, Pat. No. 3,906,805. This application Mar. 31, 1975, Ser. No. 563,316
Int. Cl.² H04B 1/06
U.S. Cl. 325—457 **6 Claims**



1. In a television tuner of the type having a detented selector shaft rotation of which is effective to tune said tuner to one of a plurality of discrete frequencies, a fine tuning mechanism, a fine tuning shaft coupled to said fine tuning mechanism, rotation of said fine tuning shaft being effective to tune said tuner over a predetermined range of frequencies about each of said discrete frequencies, and an automatic frequency control circuit, an automatic frequency control defeat mechanism comprising:

a switch affixed to said television tuner and electrically coupled to said automatic frequency control circuit, operation of said switch being effective to defeat the operation of said automatic frequency control circuit;

cam means affixed to said selector shaft for rotation therewith, said cam means having a predetermined number of lobes equal in number to the number of detent positions of said selector shaft;

a first lever pivotably attached to said tuner for engaging said cam means and said switch, said first lever being operative to operate said switch for defeating the operation of said automatic frequency control circuit upon the rotation of said selector shaft between detent positions thereof; and

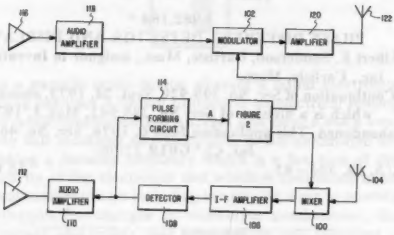
means operatively coupled to said fine tuning mechanism and said switch for defeating the operation of said automatic frequency control circuit in response to the operation of said fine tuning mechanism, said means for defeating the operation of said automatic frequency control circuit in response to the operation of said fine tuning mechanism including a second lever pivotally attached to said tuner and engageable by a portion of said fine tuning mechanism, a portion of said first lever being interposed between said second lever and said switch.

3,982,188

STATION SELECTING DEVICE HAVING IMPROVED NOISE DISCRIMINATION CIRCUITRY

Mitsuo Matsuzawa, and Kaoru Mitarai, both of Tokyo, Japan, assignors to Trio Electronics Incorporated, Tokyo, Japan

Filed Nov. 14, 1974, Ser. No. 523,862
Claims priority, application Japan, June 18, 1974, 49-69557
Int. Cl.² H04B 1/32
U.S. Cl. 325—470 **2 Claims**



1. A multichannel communication system having a station selecting device, said station selecting device comprising

information signal receiving means for receiving information signals over at least one of a plurality of channels;

means for generating a train of first pulses of predetermined width and period;

first signal generating means responsive to said train of first pulses for automatically, sequentially generating a plurality of first signals respectively corresponding to the information signals of said plurality of channels of said information signal receiving means;

said information signal receiving means including means responsive to said plurality of first signals and said information signals to generate a respective plurality of intermediate frequency signals, the frequencies of said intermediate frequency signals being a predetermined difference between said first signals and the information signals;

sensing signal generating means responsive to said intermediate frequency signals for generating a sensing signal for each of said channels;

means for integrating said sensing signal; and

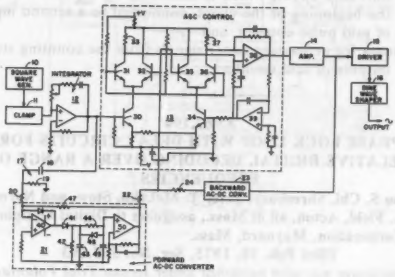
threshold means for generating a control signal to stop said first signal generating means by blocking the application of said train of first pulses to said first signal generating means in response to said first pulses and the integrated sensing signal whenever the sensing signal exceeds the threshold of said threshold means during the occurrence of one of said first pulses

whereby the sensing signals are normally discriminated from noise signals since the latter signals, when integrated, do not exceed said threshold during the occurrence of said first pulses.

3,982,189
SQUARE WAVE TO SINE WAVE CONVERTER

William O. Brooks, Canoga Park, and Clifford B. Hill, Westlake Village, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 25, 1975, Ser. No. 635,201
Int. Cl.² H03K 5/156
U.S. Cl. 328—27 5 Claims

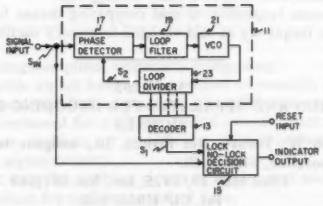


1. A wave shaping circuit, comprising in combination:
a source of square waves of variable frequency;
means for integrating said square waves thereby to develop corresponding triangular waves.
an amplifier having an automatic gain control circuit;
means for coupling said triangular waves to the input of said amplifier;
means for controlling the operation of the automatic gain control circuit of said amplifier in response to amplitude variations both in the triangular waves produced by said means for integrating said square waves and in the triangular waves present at the output of said amplifier so as to minimize any such changes in said last-mentioned triangular waves as the frequency of the square waves is varied;
a sine wave shaper for converting triangular waves to sine waves; and
means for feeding the output of said amplifier to the input of said sine wave shaper thereby to develop at the output thereof sine waves having a high degree of purity and amplitude uniformity.

3,982,190
PHASELOCK CIRCUITRY WITH LOCK INDICATION

Dietrich H. Schaefer, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed July 31, 1975, Ser. No. 600,539
Int. Cl.² H03B 3/04
U.S. Cl. 328—110 8 Claims

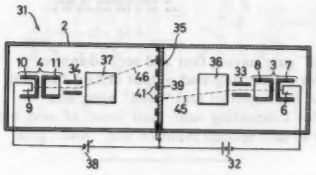


1. Phaselock circuitry comprising:
phaselock loop first means including means for receiving an input signal and a feedback signal of variable frequency and providing an output signal indicative of the phase difference between said signals, said feedback signal being provided by means including controllable oscillator means,
second means for providing a pulse train signal S_X synchronous with said input signal,
third means for providing a pulse train signal S_Y synchronous with said feedback signal,
decision circuit fourth means receiving S_X and S_Y as inputs and including coincidence determination means and counting means, said fourth means providing an output signal having a first state indicative of a lock condition or a second state indicative of a no-lock condition, whereby, said fourth means output signal state depends on the degree of concurrence between S_X and S_Y,
said input signal being a pulse train signal and S_X being the same signal as said input signal.

3,982,191
CHARGE STORAGE TUBE AND METHOD FOR OPERATING THE SAME

Hajime Takita, and Takehumi Katow, both of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1975, Ser. No. 547,964
Claims priority, application Japan, Feb. 9, 1974, 49-016576
Int. Cl.² G11C 11/34, 11/26
U.S. Cl. 328—124 11 Claims



1. A charge storage tube comprising a target, means for writing a signal in said target by generating pairs of electron-holes within said target and means for reading out said signal by scanning electron beams on said target, wherein said target comprises a semiconductor substrate with a specific resistance greater than 1 ohm/cm, an insulating layer formed on said semiconductor substrate and a metal electrode with openings formed on said insulating layer, hetero junction diodes being formed between said insulating layer and said semiconductor substrate, means for changing the target potential of said target above and below a first cross-over potential of an accelerating potential of said electron beams.

3,982,192
MINIPOWERED OPTIONAL SELF CHECKING ELECTRONIC TIMER FOR ORDNANCE

John E. Newton, East Aurora, N.Y.; Maxine Bohacz, Boonton, and Jerry H. Lyon, Stanhope, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

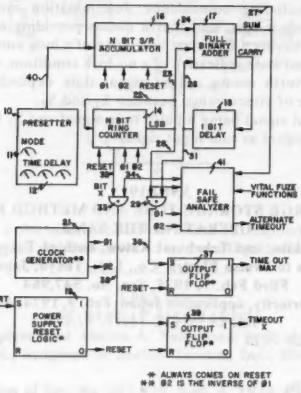
Filed Sept. 3, 1970, Ser. No. 78,315
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976
Int. Cl.² H03K 5/13, 5/159
U.S. Cl. 328—129 9 Claims

1. A time delay circuit including:
a first shift register having an input and an output;
a second shift register having an input and an output;
means for connecting said input of said first shift register to said output thereof;
a full binary adder having first, second and third inputs, a sum output and a carry output;
means for connecting said output of said second shift register to said first input of said full binary adder;

means for connecting said sum output to said input of said second shift register;

means for connecting said output of said first shift register to said second input of said full binary adder;

delay means for connecting said carry output to said third input of said binary full adder;



an "And" gate having first and second inputs;

means for connecting said output of said first shift register to said first input of said "And" gate; and

means for connecting said third input of said binary full adder to said second input of said "And" gate.

3,982,193

CIRCUIT ARRANGEMENT FOR GENERATING A SAMPLING PULSE RASTER ADAPTED TO THE VARIABLE PERIOD OF QUASIPERIODIC EVENTS

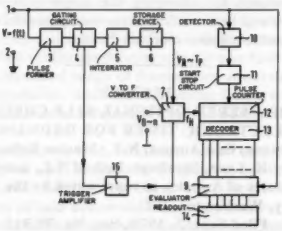
Albert Maringer, Karlsruhe, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 20, 1974, Ser. No. 534,832

Claims priority, application Germany, Dec. 21, 1973, 2364154

Int. Cl.[2] H03K *3/84, 21/30, 3/72*

U.S. Cl. 328—151 **8 Claims**



1. A circuit for generating a sampling pulse raster wherein its repetition frequency is adapted to the variable period of quasiperiodic events, comprising,

a voltage-frequency converter having at least a first input terminal and a second input terminal,

means for applying to said first input terminal a first voltage proportional to the total number of sampling raster points,

means for applying to said second input terminal a second voltage proportional to the period of said event being sampled,

an output terminal of said converter at which the converter output voltage frequency is inversely proportional to said second voltage and directly proportional to said first voltage, and

means for generating a sampling pulse raster from the signal at said converter output terminal, said means comprising,

a multiple counting stage pulse counter to one input of which is applied the voltage-frequency converter output signal,

a start-stop circuit which is addressed by a pulse marking the beginning of the event, connected to a second input of said pulse counter, and

means for generating raster signals from the counting stage outputs of said counter.

3,982,194

PHASE LOCK LOOP WITH DELAY CIRCUITS FOR RELATIVE DIGITAL DECODING OVER A RANGE OF FREQUENCIES

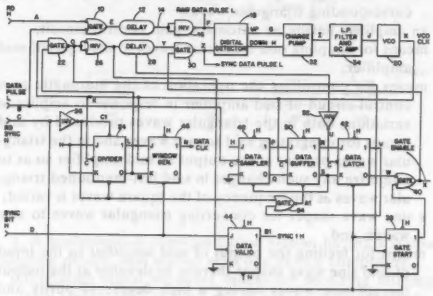
Chao S. Chi, Shresbury; Peter T. McLean, Stow, and Norman A. Field, Acton, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 18, 1975, Ser. No. 550,693

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.[2] H03B *3/04;* **H03K** *5/18*

U.S. Cl. 328—155 **10 Claims**



1. In an apparatus for synchronizing clock signals and data pulses, the combination comprising:

A. a variable frequency oscillator for providing a continuous series of said clock signals;

B. first delay means responsive to said data pulses for providing a first predetermined delay;

C. second delay means responsive to said clock signals for providing a second and third predetermined delay;

D. means responsive to said second delay means for reconditioning said data pulses to said clock signals;

E. means for comparing the output of said reconditioning means with said first delay means; and

F. means responsive to said comparing means for varying the frequency of said variable frequency oscillator.

3,982,195

METHOD AND APPARATUS FOR DECODING DIPHASE SIGNALS

Kenneth W. Turner, Des Plaines, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed May 29, 1975, Ser. No. 581,989

Int. Cl.[2] H03K *9/00*

U.S. Cl. 329—50 **13 Claims**

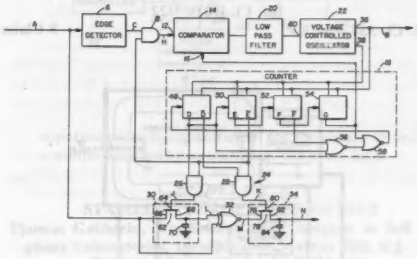
1. An apparatus for decoding a diphase signal, the apparatus providing diphase data and clock information comprising:

means for generating a clock control signal derived from the diphase signal and related to the clock which initially generated the diphase signal;

a controlled frequency oscillator the frequency of which is determined by said clock control signal derived from the clock information of the diphase signal;

a counter advanced by the output of said controlled frequency oscillator said counter having a plurality of distinct states;

means, responsive to selected states of said counter, for decoding data information from said diphase signal; and



said clock control signal generating means includes an edge detector responsive to a change in the level of said diphase signal and providing an output signal in response thereto, said clock control signal generating means including means responsive to a selected state of said counter for suppressing selected edge detector output signals having predominantely data information so that said signal controlling said oscillator is regular and directly related to the clock frequency which initially generated the diphase signal.

3,982,196

DIFFERENTIAL VOLTAGE AMPLIFIER

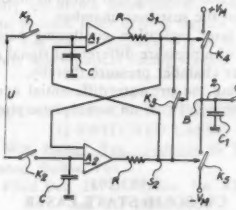
Robert Poujois, Grenoble, France, assignor to Commissariat a l'Energie Atomique, Grenoble, France

Filed Feb. 28, 1975, Ser. No. 553,996

Claims priority, application France, Mar. 1, 1974, 74.07078

Int. Cl.[2] H03F *3/45*

U.S. Cl. 330—9 **12 Claims**



1. A voltage amplifier essentially comprising:

an unstable circuit having one position of unstable equilibrium and two distinct positions of equilibrium which can be maintained for a certain period of time, each of said distinct positions of equilibrium corresponding to an input signal polarity,

an input stage for applying signals to the input of said unstable circuit for a given period of time,

said unstable circuit switching from said unstable state of equilibrium to the distinct position of equilibrium corresponding to the sign of the signal applied to the input of said unstable circuit in response to the amplitude of the signal applied to said input being greater than the noise signal at said input,

means for returning said unstable circuit to its position of unstable equilibrium,

means for calibrating the output of said unstable circuit at the voltage $+V_m$ or at the voltage $-V_m$ according to which of said distinct positions of equilibrium said unstable circuit switches,

and means for integrating the calibrated signal which appears at the output of said bistable circuit for a given period of time.

3,982,197

RADIATION RESPONSIVE VOLTAGE DIVIDING CIRCUIT

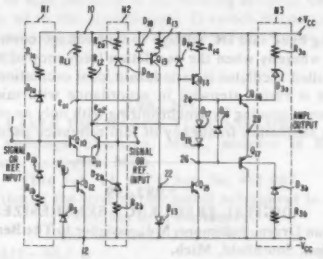
Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,542

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.[2] H03F *3/08*

U.S. Cl. 330—33 **9 Claims**



1. In a circuit having a circuit node to which is coupled a reverse-biased semiconductor junction which passes a leakage current when subjected to incident radiation, means for clamping said node to a predetermined voltage at radiation levels higher than some predetermined level including:

first and second terminals for the application therebetween of an operating potential;

first and second impedances;

first and second radiation responsive elements, said elements being of the type which in the absence of radiation have a high equivalent impedance which decreases in response to radiation;

means connecting said first impedance in series with said first element between said first terminal and said circuit node; and

means connecting said second impedance in series with said second element between said second terminal and said circuit node.

3,982,198

OSCILLATORS

Noboru Saikaishi; Yukio Numata; Tetsuo Takahashi; Morio Kumagai, and Michinori Naito, all of Tokyo, Japan, assignors to Trio Electronics Incorporated, Tokyo, Japan

Filed Sept. 25, 1974, Ser. No. 509,274

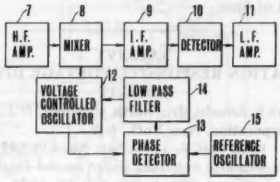
Claims priority, application Japan, Oct. 23, 1973, 48-119187

Int. Cl.[2] H04B *1/16*

U.S. Cl. 331—27 **2 Claims**

1. An oscillator for a broadcasting receiver comprising a voltage controlled oscillator the output frequency of which is the local oscillation frequency output for said broadcast receiver, means for forcibly varying the oscillation frequency of said voltage controlled oscillator, a reference oscillator having an oscillation frequency equal to to half the allocated frequency spacing between individual broadcast stations in the

broadcast band, means for setting said reference oscillator to oscillate at a duty ratio of 50%, a phase detector for detecting the phase difference between the oscillation frequency of said voltage controlled oscillator and that of said reference oscillator, means for filtering the output of said phase detector for producing a DC voltage, and a phase synchronizing loop for



feeding back said DC voltage to said voltage controlled oscillator, whereby when the oscillation frequency of said voltage controlled oscillator is varied, said local oscillation frequency output is varied stepwise in accordance with said allocated frequency spacing by synchronizing with only an odd multiple of the oscillation frequency of said reference oscillator.

3,982,199

DIGITAL FREQUENCY SYNTHESIZER

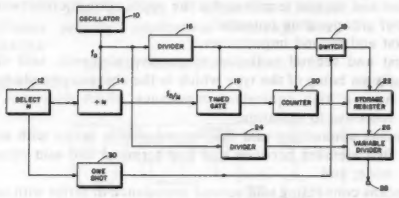
Norman Green, Baltimore, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 6, 1975, Ser. No. 538,686

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.[2] H03K *29/00*

U.S. Cl. 331—51 **10 Claims**



1. A digital frequency synthesizer comprising:

a source of a reference frequency signal;

a variable digital frequency divider means for dividing said reference frequency signal by a selected integer N;

a counter for accumulating a count related to the number of cycles of a frequency signal applied thereto;

gate means for applying, when open, the reference frequency as divided by said variable digital frequency divider means to said counter, said gate means being open for a predetermined time period;

programmable variable digital frequency divider means responsive to the count accumulated in said counter for setting the divisor thereof in proportion thereto and for dividing a frequency signal applied thereto by said divisor; and,

means for applying said reference frequency signal to said programmable variable digital frequency divider.

3,982,200

ELECTRON BEAM GAS DISCHARGE LASER PRESSURE CONTROL

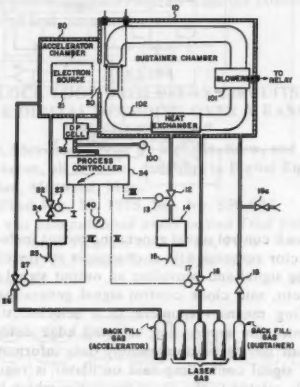
Ethan D. Hoag, Boston, and Henry E. Pease, Malden, both of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Sept. 4, 1973, Ser. No. 394,350

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl. H01s *3/22*

U.S. Cl. 331—94.5 P **9 Claims**



1. Method of operating a two chamber gas laser of the type having an accelerator chamber and a sustainer chamber separated from each other by a thin diaphragm comprising:

continuously sampling pressures from each of said chambers during simultaneous pumpdown thereof and generating continuously a pressure differential signal and applying said signal to modulate the rate of accelerator chamber pumpdown during initial pumpdown of said two chambers,

continuing said continuous generation of a pressure differential signal and applying said signal to modulate the rate of backfill of the sustainer chamber,

then during laser operation continuing said continuous generation of a pressure differential signal and modulating sustainer chamber pressure thereby,

and maintaining the pressure differential across said diaphragm within 2/10 of an atmosphere throughout said operations.

3,982,201

CW SOLID STATE LASER

L. Jay Rosenkrantz, Brookfield Center; Robert S. Rowley, Ridgefield, both of Conn., and John B. Schroeder, Vashon, Wash., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 24, 1975, Ser. No. 543,812

Int. Cl.[2] H01S *3/094*

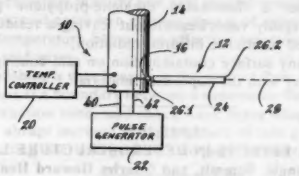
U.S. Cl. 331—94.5 P **8 Claims**

1. A continuous wave producing solid state laser comprising:

a main solid state laser capable of being end pumped into a lasing mode; and

an array of pump light emitting semiconductor diode lasers arranged to direct their pump light onto an end of the solid state laser for enhanced absorption in the laser and stimulation of the emission of a laser beam therefrom, means for pulsing the diode lasers of the array at a low

duty cycle rate, of not more than ten percent, the pulses each being sufficient to pump the main laser and the



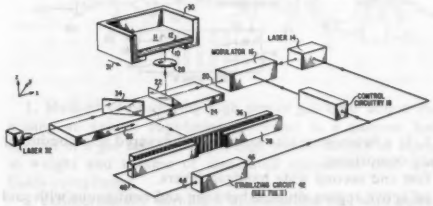
repetition rate being sufficient for the pulses to maintain a continuous lasing output from the main laser.

3,982,202

STABILIZATION OF LASER OUTPUT

Thomas Goldstein, Woodbridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 2, 1975, Ser. No. 592,370
Int. Cl.² H01S 3/13
U.S. Cl. 331—94.5 S **6 Claims**



1. In combination, a pulse-operated laser, means external to said laser for generating timing signals for driving said laser to control the pulse-mode operation thereof, said timing signals including uniformly spaced-apart signals and randomly occurring nonuniformly spaced-apart signals, and a phase-locked-loop circuit interposed between said generating means and said laser for processing said timing signals to in effect remove the randomly occurring nonuniformly spaced-apart signals therefrom to provide laser driving signals that are uniformly spaced apart and whose frequency is an integral multiple of said uniformly spaced-apart timing signals.

3,982,203

METHOD OF PREVENTING POST PULSING OF Q-SWITCHED LASER

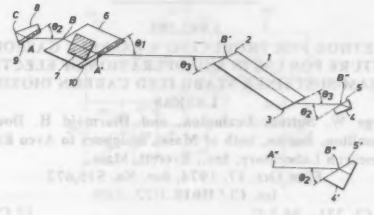
Michiel de Wit, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 28, 1973, Ser. No. 429,474
Int. Cl.² H01S 3/00
U.S. Cl. 331—94.5 Q **1 Claim**

1. A method of preventing post pulsing of an acousto-optically Q-switched laser system comprising a laser cavity which includes therein a laser rod, first reflecting means mounted along the optical axis of said rod, feedback reflecting means mounted on the opposite side of said rod from said first reflecting means at an angle to said axis, optical pumping means for exciting the laser rod, and an acousto-optic Q-switch mounted on the optical axis of the laser rod between the laser rod and the feedback reflecting means and energizable for deflecting radiation from said laser rod to said feedback reflecting means to provide lasing action as a Q-switched pulse of lasing energy, said method comprising:

placing a filtering material within the laser cavity between said laser rod and said optical pumping means wherein the filtering material is substantially transparent to pumping radiation and substantially opaque to radiation at the lasing wavelength, and

preventing residual radiation emitted in random directions from the laser rod at the lasing wavelength from being deflected into the rod into directions near enough to the



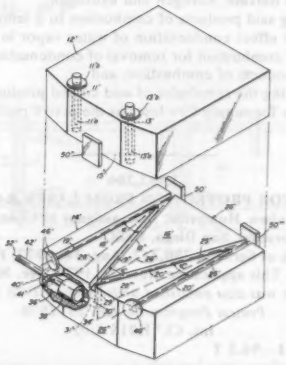
axial direction to be regeneratively amplified, by absorption of said radiation in the filtering material during periods when the acousto-optic Q-switch is energized and following the generation of the Q-switched pulse of lasing energy.

3,982,204

LASER DISCHARGE TUBE ASSEMBLY

Keimpe Andringa, Sherborn, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 11, 1974, Ser. No. 441,087
The portion of the term of this patent subsequent to Jan. 6, 1993, has been disclaimed.
Int. Cl.² H01S 3/03, 3/083
U.S. Cl. 331—94.5 D **2 Claims**



1. In combination:

a. a resonator;

b. a laser gas discharge tube assembly disposed in such resonator, such assembly having a pair of blocks, one of such blocks having an optically smooth surface and the other one of such blocks having at least a pair of grooves formed in a portion of an optically smooth surface thereof, such pair of grooves being arranged in a V-shape, the surfaces of the pair of blocks being in mutual contact to form a laser capillary;

c. means for confining a laser gas in such laser capillary;

d. means for directing a first pair of oppositely polarized laser waves through the laser capillary in a first direction and a second pair of oppositely polarized laser waves through said laser capillary in a direction opposite to such first direction, each one of such polarized waves having a different frequency; and

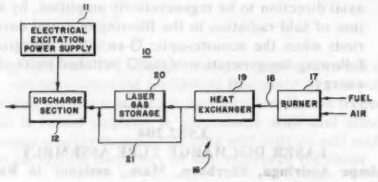
e. a polarization dispersive structure disposed in the path of the two pairs of waves comprising: an anisotropic crystal, the crystallographic axis of such crystal being oriented to produce different delays to the oppositely sensed polarized laser waves passing therethrough, such delays being related to such orientation.

3,982,205

METHOD FOR PRODUCING A LASABLE GASEOUS MIXTURE FOR USE IN AND OPERATION OF ELECTRON BEAM-SUSTAINER STABILIZED CARBON DIOXIDE LASERS

George W. Sutton, Lexington, and Diarmaid H. Douglas-Hamilton, Boston, both of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Oct. 17, 1974, Ser. No. 515,672
Int. Cl.² H01S *3/22, 3/09*
U.S. Cl. 331—94.5 G 12 Claims



1. A method of preparing an active medium for gas laser devices which comprises the steps of:

a. burning a hydrocarbon fuel in the presence of air under conditions to consume at least substantially all the oxygen to produce products of combustion comprising at least carbon dioxide, nitrogen and hydrogen;

b. cooling said products of combustion to a temperature to at least effect condensation of water vapor in said products of combustion for removal of condensable matter in said products of combustion; and

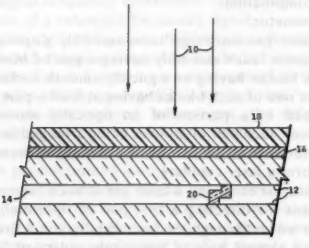
c. collecting the remainder of said cooled products of combustion for supply to a laser as the active medium therefor.

3,982,206

SYSTEM FOR PROTECTION FROM LASER RADIATION

Peter D. Poulsen, Huntsville, Ala., assignor to General Dynamics Corporation, San Diego, Calif.

Division of Ser. No. 280,312, Aug. 14, 1972, Pat. No. 3,871,739. This application Nov. 27, 1974, Ser. No. 527,669
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² H01S *3/02*
U.S. Cl. 331—94.5 T 10 Claims



1. A protective cover window for use with high energy infrared lasers which comprises:

a plate which is substantially transparent to infrared radiation, positioned in the path of radiation from an infrared laser, and

a coating on at least one surface of said plate, said coating comprises a fluorinated ethylene-propylene polymer which rapidly vaporizes without leaving a residue when subjected to intense infrared radiation,

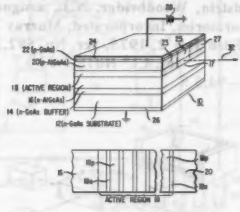
whereby any surface contamination on said coating is carried away with the vaporizing material.

3,982,207

QUANTUM EFFECTS IN HETEROSTRUCTURE LASERS

Raymond Dingle, Summit, and Charles Howard Henry, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 7, 1975, Ser. No. 556,305
Int. Cl.² H01S *3/00*
U.S. Cl. 331—94.5 H 10 Claims



1. In a heterostructure laser, a multilayered semiconductor body comprising:

first and second wide bandgap layers,

an active region situated between and contiguous with said first and second layers, CHARACTERIZED IN THAT,

said active region includes a plurality of active layers and a plurality of passive layers interleaved with one another,

said passive layers having a wider bandgap than said active layers, thereby forming energy barriers between said active layers,

said passive layers being sufficiently thin to permit carriers to tunnel through or hop over said energy barriers when said body is suitably pumped, and

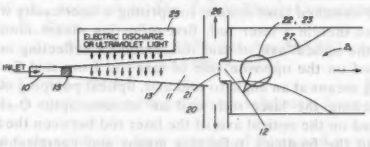
said active layers being sufficiently thin to produce quantum effects in said body including separating the discrete energy levels of carriers in said active layers.

3,982,208

CW SHOCK INITIATED HF/DF LASER

Morton Camac, Lexington, Mass., assignor to Aerodyne Research Incorporated, Bedford, Mass.

Filed June 30, 1975, Ser. No. 591,603
Int. Cl.² H01S *3/09*
U.S. Cl. 331—94.5 G 11 Claims



1. A method of producing laser radiation from chemical reaction comprising:

providing a flow of a first reaction gas mixture comprising a first reaction gas and an initiator for a second reaction gas,

providing a separate flow of a second reaction gas, said first reaction gas and said second reaction gas being reactive with each other to form a vibrationally excited product

providing a flow of a noble gas buffer to one of said first reaction gas mixture and said second reaction gas,

mixing said gases in a moving stream of supersonic flow at a temperature below the effective reaction temperature of said gases,

establishing a shock wave in the path of flow of said mixed gases at a boundary between a supersonic flow region and a reaction zone, said shock wave being adapted to cause an abrupt increase in temperature of said gases, and

extracting laser energy from said gases in said reaction zone.

3,982,209

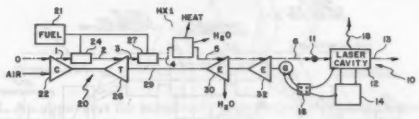
COMBUSTION-ELECTRIC LASER

George W. Sutton, Lexington, and Diarmaid H. Douglas-Hamilton, Boston, both of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Oct. 17, 1974, Ser. No. 515,673

Int. Cl.² H01S *3/22, 3/09*

U.S. Cl. 331—94.5 G **19 Claims**



1. Method of producing high power gas laser action comprising an energy population inversion in a gaseous lasing species in a gas laser having a high power density in relation to weight and volume of associated equipment and stored fluids comprising:

a. exothermically burning a hydrocarbon fuel with ambient air to produce gaseous combustion products comprising energy of combustion and a gas mixture comprising a polyatomic lasing gas, diluent and deactivant gases, said deactivant gases comprising hydrogen and water vapor;

b. isentropically expanding the combustion products gas mixture;

c. removing said water vapor;

d. reducing the temperature of the combustion products to less than about 300°K using said energy of combustion;

e. passing said cooled combustion products through a laser beam producing region in said laser;

f. maintaining an electrical discharge in said laser beam producing region; and

g. controlling said discharge and combustion products passage rate to produce an energy population inversion in said polyatomic lasing gas and to generate a laser beam in said laser beam producing region.

3,982,210

AUTOMATIC GAIN CONTROL CIRCUIT FOR A CRYSTAL OSCILLATOR

James Keith Gehrke, Carpentersville, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 22, 1975, Ser. No. 624,617

Int. Cl.² H03B *3/02, 5/36*

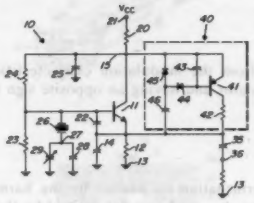
U.S. Cl. 331—109 **7 Claims**

1. An automatic gain control circuit for a crystal oscillator comprising:

a. a crystal controlled oscillator with an output and including a transistor with a fixed bias in combination with a tank circuit;

b. transistor means having first, second and control terminals, the first and second terminals coupling said transistor means in parallel with the trnsistor of said oscillator for providing an alternate current path for current flowing to the transistor when said transistor means is conducting to reduce the current gain of said transistor; and

c. biasing means coupled to the output of said oscillator and to the control terminal of said transistor means for sensing the amplitude of signals at the output of said oscillator and controlling the conduction of said transistor means to maintain the signals approximately at a predetermined level.



3,982,211

LINEARIZED VARACTOR FREQUENCY MODULATED SEMI-CONDUCTOR DIODE OSCILLATOR

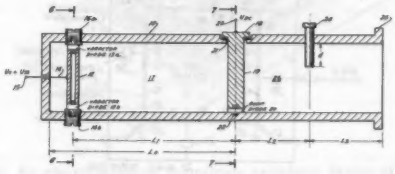
György Géza Endersz, Alvsjo, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation-in-part of Ser. No. 476,915, June 6, 1974, abandoned. This application May 1, 1975, Ser. No. 573,778

Claims priority, application Sweden, June 25, 1973, 7308906

Int. Cl.² H03C *3/22*

U.S. Cl. 332—30 V **7 Claims**



1. A linearized frequency modulated semiconductor oscillator, preferably operating in the microwave range, comprising: an active semiconductor element for generating a wave having a fundamental frequency and at least a second harmonic frequency; a frequency modulator in the form of a voltage dependent capacitor, adapted to be connected to a source of constant voltage upon which is superimposed a modulating voltage; and a reactance circuit for compensating for non-linear changes in the capacitance of said capacitor and to compensate for the non-linearity in the fundamental frequency due to the change in said capacitance, said reactance circuit having a transfer function $H(j\omega)$ with poles situated in or close to the frequency location of one of the harmonics of said semiconductor element, and said reactance circuit at one of these harmonics being strongly coupled to said semiconductor element, but weakly coupled to said voltage dependent capacitor, the absolute value $|H(j\omega)|$ of said transfer function being chosen so that

$$\left|\left|\frac{d^2\omega_a}{d\,Um^2}\right| - \left|\frac{d^2\omega_m}{d\,Um^2}\right|\right| \leq \epsilon$$

where Um indicates the modulating voltage, and ωm indicates the corresponding deviation from the oscillator fundamental frequency, the factor

$$\frac{d^2\omega_m}{d\,Um^2}$$

being given from the modulation characteristic of the frequency modulator and having an opposite sign relatively the factor

$$\frac{d^2\omega_a}{d\,Um^2},$$

frequency perturbation ωa caused by the harmonics of the semiconductor element being determined by the relation

$$\omega_a = \frac{n^2-1}{2}\left(\frac{an}{a1}\right)^2 \left|H(j\omega)\right|^2$$

where $n = 1, 2, 3, \ldots$ is the order number of the chosen harmonic, an/al
is the amplitude of the n:th harmonic normalized to the fundamental al. and ϵ is a number determined by the desired linearity within the actual deviation range.

3,982,212
SWITCHING ARRANGEMENTS

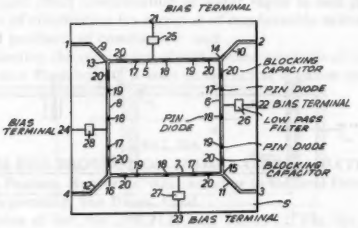
John Richard Wallington, London, and John Graham Richings, Burnham-on-Crouch, both of England, assignors to The Marconi Company Limited, Chelmsford, England

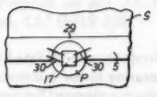
Filed May 2, 1975, Ser. No. 573,981

Claims priority, application United Kingdom, June 14, 1974, 26414/74

Int. Cl.² H01P 1/15

U.S. Cl. 333—7 D **4 Claims**





1. A switching device having four ports for routing very high frequency signals of center wavelength λ in selectable routes between said ports in response to applied biasing signals, said device comprising a groundplane and four microstrips connected end-to-end to form a closed loop having four microstrip junctions; each of said microstrips being generally of uniform width but having at lengthwise intervals of $n\lambda/4$, n being an odd integer, at least one portion reduced in width so as to form a narrow web of microstrip; each given microstrip having, for each of said at least one portions contained therein, a variable impedance PIN diode connecting each such web of said given microstrip to said groundplane, each given microstrip having a terminal means coupled thereto for applying said biasing signals, said PIN diodes being responsive to said biasing signal to assume a low-impedance state so as to provide an electrical shunt between said microstrip and said groundplane, whereby to prevent the passage of said very high frequency signals through said microstrip conductor, and said PIN diode being responsive to the absence of said biasing signals to assume a high impedance state so as to provide an open circuit between said microstrip and said groundplane, whereby to allow the passage of said very high frequency signals through said microstrip conductor.

3,982,213
MONOLITHIC RECIPROCAL LATCHING FERRITE PHASE SHIFTER

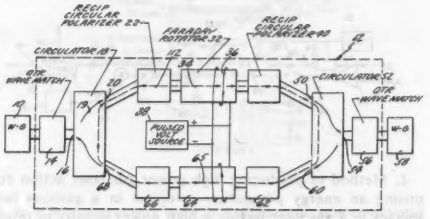
Peter W. Smith, and An-Hwa Soong, both of Westport, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 16, 1975, Ser. No. 568,770

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² H01P 1/18

U.S. Cl. 333—31 A **5 Claims**



1. A reciprocal, latching ferrite phase shifter for providing selectable phase delays to linearly polarized microwaves of electromagnetic radiation propagating between wave transmission waveguides in opposite directions, comprising:

a plurality of electrical coil windings;

a plurality of permanent magnets; and

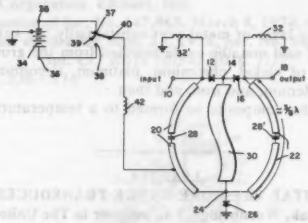
a geometrically symmetrical, monolithic, solid ferrite structure of generally rectangular shape, having a pair of ends of rectangular cross-section and adapted to interface with a related waveguide, said structure having a centrally disposed slot extending transversely entirely through said structure and extending longitudinally along a substantial portion of said structure providing a pair of similar, independent wave transmission paths, one of said windings being disposed around each of said paths and operable in response to voltage pulses applied thereto for latching said paths in a magnetic state, each configuration of winding and path thereby comprising first means for providing a phase shift to waves of circular polarization being transmitted therethrough, each of said paths having portions, at opposite ends of each of said windings, shaped to provide second means for converting waves between plane polarization and circular polarization in a reciprocal fashion, each of said second means of said paths being contiguous to a related one of two further portions, each of said further portions having a pair of said permanent magnets disposed on opposite surfaces thereof to provide a magnetic field transverse to the longitudinal axis of said structure and each further portion being shaped to provide, in combination with said pair of magnets, third means for providing selective, directional propagation of waves such that waves propagating into the respective end of said structure from the related waveguide pass into one of said paths but not into the other of said paths and waves propagating from the other of said paths pass through the respective end of said structure into the related waveguide but not into the other one of said paths.

3,982,214

180° PHASE SHIFTING APPARATUS

Richard W. Burns, Orange, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 23, 1975, Ser. No. 625,344
Int. Cl.² H03H 7/30
U.S. Cl. 333—31 R 10 Claims



1. An apparatus for selectively introducing a predetermined phase shift in a signal, said apparatus comprising an input terminal and an output terminal; a first unidirectionally conducting device connected from said input terminal to an intermediate junction; a second unidirectionally conducting device connected from said intermediate junction to said output terminal; first, second and third segments of transmission line connected from said input terminal, said intermediate terminal and said output terminal, respectively, to a common junction, said first, second and third segments of transmission line each being greater than one-quarter wavelength and less than one-half wavelength long at the frequency of said signal; a third unidirectionally conducting device connected from said common junction to a third junction maintained at a substantially fixed reference potential; and means coupled to said first, second and third unidirectionally conducting devices for simultaneously rendering said first, second and third devices conductive or non-conductive.

3,982,215

METAL PLATED BODY COMPOSED OF GRAPHITE FIBRE EPOXY COMPOSITE

Gerald Joy-Pak Lo, Montreal; Francis Leo Papworth, Dollard des Ormeaux; Nicolas Elmars Tenne-Sens, Lachine; Michael Valentine O'Donovan, Dorval, and Gerald Dziub, St. Laurent, all of Canada, assignors to RCA Corporation, New York, N.Y.

Filed Mar. 8, 1973, Ser. No. 339,194
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl.² H01P 1/20, 3/12, 11/00
U.S. Cl. 333—73 W 1 Claim

1. A hollow microwave waveguide filter having good inner surface electrical conductivity comprising

a tubular shaped body composed of graphite fibre epoxy composite,

said body having its inner surface slightly roughened,

a thin flash coating of hardened nickel on said inner surface,

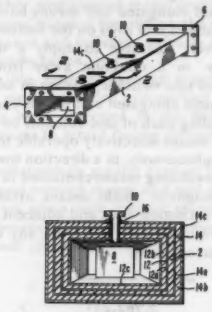
a thicker coating of copper on said nickel coating,

a coating of silver over said copper coating,

a thin flash outer coating of hardened nickel on the outer surface of said body,

a thicker outer coating of copper on said outer nickel coating

solder areas on said outer copper coating, said solder having a melting point of up to about 150°C., and



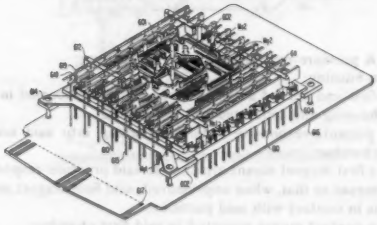
a coating of silver over said solder areas and outer copper coating.

3,982,216

ELECTROMAGNETIC COORDINATE SWITCHING DEVICE

Sadayuki Mitsuhashi; Norio Suzuki, and Kazuyoshi Nago, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Sept. 9, 1975, Ser. No. 611,767
Claims priority, application Japan, Sept. 9, 1974, 49-103588
Int. Cl.² H01H 67/14
U.S. Cl. 335—112 9 Claims



1. An electromagnetic coordinate switching device of the divisionally excited type comprising;

a plurality of switching means, each with two ends, having a magnetic self-holding action such that said means conducts only when both ends are in magnetic fields having the same orientation;

a magnetic shunt means having sides, and a top and bottom with through apertures therebetween, said apertures arranged in rows and columns such that the apertures are located at the crosspoints of said rows and columns, at least one of said switching means being inserted in each of said apertures such that a magnetic field at one end of the switch is not felt at the other end;

a plurality of first elongated coil means each having two leads, surrounding each of said rows on the top of said shunt means with a space between said coil means and said shunt means such that a second elongated coil means can be placed therebetween, said first elongated coil means selectively operable to apply a magnetic field simultaneously, in a direction away from said shunt means, to the switching means contained in said row;

a plurality of second elongated coil means each having two leads, surrounding each of said columns, in the space between said first elongated coil means and said shunt

means, selectively operable to apply a magnetic field simultaneously, in a direction toward the shunt means, to all of said switching means in said column;

a plurality of third elongated coil means having two leads, surrounding each of said rows on the bottom of said shunt means selectively operable to apply a magnetic field simultaneously, in a direction away from said shunt means, to all of said switching means in said row;

a plurality of fourth elongated coil means each having two leads, surrounding each of said columns on the bottom of said third coil means selectively operable to apply a magnetic field simultaneously, in a direction toward the shunt means, to the switching means contained in said row; and

a plurality of magnetic shield means arranged between adjacent first excitation coils and adjacent fourth excitation coils to insulate each coil from any magnetic field caused by adjacent coils.

3,982,217

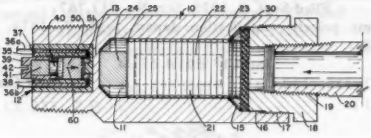
PRESSURE-OPERATED SWITCH

David E. Reynolds, Littleton, Colo., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 537,985, Jan. 2, 1975, which is a division of Ser. No. 459,151, April 8, 1974, Pat. No. 3,935,567. This application Apr. 14, 1975, Ser. No. 567,584

Int. Cl.[2] H01H *85/02*

U.S. Cl. 335—207 **7 Claims**



1. A pressure-responsive switch comprising:

a. a housing;

b. first and second axially aligned chambers formed in said housing and separated by a partition;

c. pressure-responsive means extending into said second chamber;

d. a first magnet means attached to said pressure-responsive means so that, when unpressured, said first magnet means is in contact with said partition;

e. a contact means mounted in said first chamber;

f. a second magnet means rigidly mounted in said first chamber;

g. a third magnet means slidably mounted in said first chamber between said partition and said second magnet means; and

h. a second contact means carried by said third magnet in a manner to mate with said first-mentioned contact means.

3,982,218

TEMPERATURE SENSING DEVICE AND METHOD

Meryle D. W. Adler, and John T. Brown, both of Bradford, Pa., assignors to Corning Glass Works, Corning, N.Y.

Filed Sept. 19, 1974, Ser. No. 507,284

Int. Cl.[2] B05D *5/12;* **H01C** *7/04*

U.S. Cl. 338—22 R **19 Claims**

1. A device for sensing temperature comprising

a dielectric substrate,

a first adherent electroconductive film of a metallic oxide on the exterior surface of said substrate,

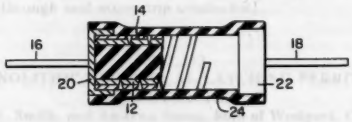
a layer of metal disposed over substantially the entire surface of said metallic oxide film selected from the group consisting of nickel, chromium, platinum, zirconium, zinc, molybdenum, and iron, and

a pair of terminals affixed to the ends of said substrate in electrical contact with said layer of metal.

8. A method of forming a temperature sensing device comprising

providing a dielectric substrate,

forming an adherent coating of an electroconductive metallic oxide on the surface of said substrate,



applying a layer of metal over substantially the entire surface of said metallic oxide selected from the group consisting of nickel, chromium, platinum, zirconium, zinc, molybdenum, and iron, and then

heating the composite so formed to a temperature up to 750°C.

3,982,219

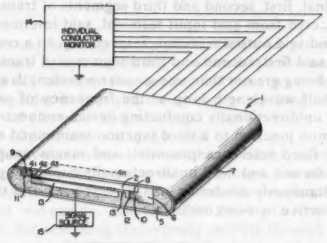
DIGITAL PRESSURE/RANGE TRANSDUCER

Dale J. Rehak, Woodbridge, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 19, 1975, Ser. No. 551,186

Int. Cl.[2] H01C *10/06*

U.S. Cl. 338—96 **9 Claims**



1. A pressure transducer comprising:

a first element made of rigid material;

a plurality of parallel bare conductors attached to one surface of said first element; and

a second element having at least one electrically conductive surface; and

means to assemble said first and second element in such a manner that said plurality of parallel bare conductors is facing said at least one conductive surface of said second element but spaced apart therefrom, and such that the space between said at least one conductive surface and said plurality of parallel bare conductor progressively increases in a direction at right angles to the longitudinal axis of each of said plurality of parallel conductors such that said first and second elements form a wedge shape, said means to assemble said first and second elements being compressible whereby said plurality of parallel bare conductors will, under the influence of a force applied to said transducer, progressively contact said at least one conductive surface in an ordered sequence, the number of said plurality of parallel bare conductors contacting said at least one conductive surface under the influence of a given force being directly related to the magnitude of said force; the last said means including a first irregular shaped compressible element having a pocket in which said second element is secured, a ledge to support one

edge of said first element and a channel, a second irregular shaped compressible element located in said channel and having a protrusion to support the other edge of said first element such that said other edge of said first element is separated from said at least one conductive surface of said first element by a distance greater than the distance that said one edge of said first element is separated from said at least one conductive surface of said second element, and a protective sheath covering the entire assembled pressure transducer.

3,982,220

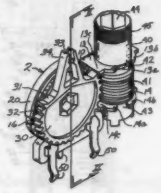
VARIABLE RESISTANCE CONTROL

Arthur L. Rozema; John D. Van Benthuysen, both of Elkhart, Ind., and John Zdanys, Edwardsburg, Mich., assignors to CTS Corporation, Elkhart, Ind.

Continuation of Ser. No. 447,968, March 4, 1974, abandoned. This application Sept. 23, 1974, Ser. No. 508,349

Int. Cl.² H01c *10/34*; H01C *1/12*

U.S. Cl. 338—174 **12 Claims**



1. A variable resistance control comprising a collector element, a resistance element disposed in spaced relationship with the collector element, a driven member supported by the collector element, a contactor carried by the driven member for wiping the collector element and the resistance element intermediate the ends thereof, a yoke integral with one of said collector element and said resistance element, and a driving member rotatably supported by the yoke and operably engaging the driven member, said yoke comprising at least one arm adapted for deformation for securing the driving member to the yoke.

3,982,221

CONTACT SPRING FOR VARIABLE RESISTANCE DEVICE

Ronald Eugene Smith, Riverside, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed Dec. 2, 1974, Ser. No. 528,761

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² H01C *1/12*

U.S. Cl. 338—202 **15 Claims**

1. A contact spring, suitable for use in a variable resistance device having a resistance strip, a collector strip adjacent said resistance strip, electrical terminals associated with said resistance and collector strips, and means to move a contact spring across the surfaces of said resistance and collector strips, said contact spring comprising:

a base member adapted for attachment to said spring moving means,

electrically conductive contact means depending from said base member, said contact means comprising a cantilever spring means adapted for sliding electrical contact with said resistance and collector strips so as to effect a short circuit therebetween, and

a stiffly flexible, resilient back-up means depending from said base member toward said contact means, said back-up means being disposed in the flexing path of said contact means to retard flexing thereof toward said base member,

whereby a substantially greater contact force is established between said contact means and said resistance and collector strips when said contact means flexes into said back-up means than would be established by the spring force of said contact means alone.

3,982,222

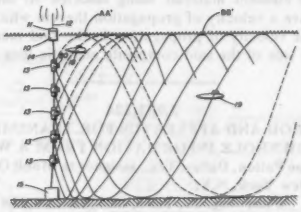
DEEP HYDROPHONE STRING

Robert J. Urick, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 22, 1965, Ser. No. 502,713

Int. Cl.² G01S *9/66*

U.S. Cl. 340—2 **5 Claims**



1. A deep hydrophone string for detecting the presence of underwater vessels comprising:

a floating buoy,

an anchor member,

a cable means connecting said buoy and said anchor member,

a plurality of hydrophone units supported by said cable means and spaced at predetermined intervals thereon between said buoy and said anchor member,

an array of hydrophones within each of said units and so arranged therein to receive sound waves emanating from vessels positioned within the annular zone defined by a conical pencil of rays upwardly-divergent from the array,

an array of hydrophones within each of said units and so arranged therein to receive sound waves emanating from vessels positioned within the annular zone defined by a conical pencil of rays downwardly-divergent from the unit,

means within each of said units for amplifying and transmitting signals of any sound waves so received through said cable to the buoy, and

means within said buoy for transmitting said signals to a surface monitor.

3,982,223

COMPOSITE ACOUSTIC LENS

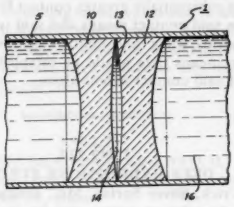
Philip S. Green, Redwood City, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed July 10, 1972, Ser. No. 270,274

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.[2] H04B *13/00*

U.S. Cl. 340—8 L 17 Claims



1. A composite acoustic lens adapted for use in fluid media including at least a pair of lens elements composed of a solid lens medium and a liquid filler medium included between said pair of lens elements, the materials of said lens medium and fluid filler medium being selected so that the velocity of propagation of acoustic waves in the medium on at least one side of the said composite acoustic lens is intermediate the velocity of the acoustic waves in the media of the lens and the filler, said lens element material being selected so that acoustic waves have a velocity of propagation therein which is higher than their velocity of propagation in the said medium on at least one side of the said composite acoustic lens.

3,982,224

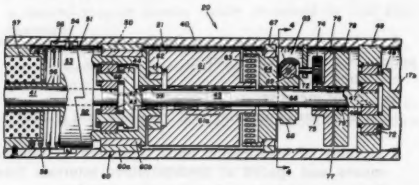
METHOD AND APPARATUS FOR TRANSMITTING DOWNHOLE INFORMATION FROM A WELL

Bobbie Joe Patton, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 23, 1973, Ser. No. 390,828

Int. Cl.[2] G01V *1/40*

U.S. Cl. 340—18 NC 27 Claims



1. A method of transmitting information from a downhole location in a well through a liquid medium in the well, said method comprising:

generating an acoustical pressure wave signal in said liquid at a point downhole in said well, said wave signal having a constant frequency and phase state; and

altering said wave signal in response to said information to be transmitted to shift the phase state of said signal, said shift of said phase state being carried out in a time period which produces, when said wave signal is synchronously rectified, a time for said phase state shift effectively equal to zero.

3,982,225

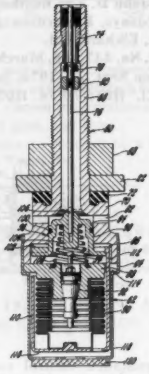
PNEUMATIC SWITCH FOR LOW TIRE PRESSURE WARNING SYSTEM

Manfred P. H. Schlanzky, Alpena, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1975, Ser. No. 638,968

Int. Cl.[2] B60C *23/02*

U.S. Cl. 340—58 3 Claims



1. In a low pressure warning system for a vehicle mounted pneumatic tire assembly normally inflated to a normal operating pressure, a low pressure sensing unit for providing a signal when the tire inflation pressure drops to a certain amount below the normal operating pressure comprising

a support member secured to the said tire assembly,

an expansible chamber fixed to the support and including a wall portion movable in response to the differential of air pressures acting on the movable portion, the exterior of the chamber being exposed to the tire inflation pressure and the interior of the chamber being charged to a reference pressure,

the chamber including a normally closed valve effective when opened to provide air communication between the interior and exterior of the chamber thereby tending to equalize the interior and exterior air pressures,

valve actuating means,

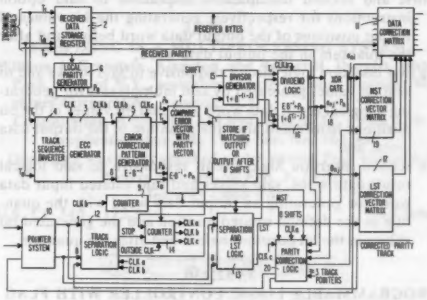
means operating the valve actuating means to open the valve for charging the reference pressure in the chamber to the normal operating pressure when the tire is normally inflated, and

means actuated by the movable wall portion connected to signal actuating means for producing a signal when the tire inflation pressure drops a first amount below the chamber reference pressure and further connected to the valve actuating means for opening the valve when the tire inflation pressure drops a second amount larger than the said first amount below the chamber reference pressure to relieve pressure from the chamber interior whereby the pressure differential acting on the movable wall portion is limited to a value insufficient to damage the expansible chamber.

3,982,226
MEANS AND METHOD FOR ERROR DETECTION AND CORRECTION OF DIGITAL DATA

William H. Bunker, and Juan A. Rodriguez, both of Boulder, Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Apr. 3, 1975, Ser. No. 564,741
Int. Cl.² G06F *11/12*
U.S. Cl. 340—146.1 AL **12 Claims**



1. Apparatus for identifying and correcting errors in one or two tracks of digital information derived from a multi-track medium, bits of data from ones of the tracks forming a byte, said tracks including a parity track, said bytes including n data bytes D_1–D_n and an error checking code ECC byte of i bits, said error checking code ECC being related to said data bytes according to the relation

$$ECC = \begin{bmatrix} n=7 \\ m=1 \\ \Sigma \ D_n X^m \\ n=1 \\ m=7 \end{bmatrix} [X^0 + X^3 + X^4 + X^5 + X^8]$$

comprising:

logic means for operating sequentially upon each of n received data bytes and an ECC byte to produce an error term E, said error term being equal to zero in the absence of errors in the received data and ECC bytes;

second logic means for regressively operating upon said error term $-i$ times to produce the vector EB^{-i};

means for accepting signals representative of data bits of the digital information and responsive thereto for deriving a parity character P_n which in combination with a data byte D_n produces an even number of data bits of a first kind;

combining means for logically combining a regressed error vector and a parity vector P_n on a bit-by-bit basis to form the expression $EB^{-i} + P_n$;

a data correction matrix;

parity correction logic means coupled to said logic means and to said means for accepting for receiving an error vector and a parity vector and operative to apply a signal to said data correction matrix to correct the ith data track to conform with said parity vector when said regressed error vector equals said parity vector;

means for receiving track pointers indicating the presence of errors in ones of said tracks and for disabling the correction apparatus when three or more tracks are in error;

track separation logic means coupled to said means for receiving and responsive to track pointers for identifying the separation $(i-j)$ between a most significant track i which is associated with a lower-order polynomial term and a least significant track j which is associated with a higher-order polynomial term of the polynomial

$$\begin{matrix} m=1 \\ n=7 \\ \Sigma \ D_n X^m; \\ m=7 \\ n=1 \end{matrix}$$

a divisor generator coupled to said track separation logic for selecting the term $1 + B^{-(i-j)}$ in accordance with track separation $(i-j)$;

dividend logic means for dividing said regressively operated vector by the output of said divisor generator to produce an error vector e_{nj} for data in the least significant track j in error;

logic means for combining on a bit-by-bit basis said derived parity character P_n and said error vector e_{nj} to produce an error vector e_{ni} for data in the most significant track i in error;

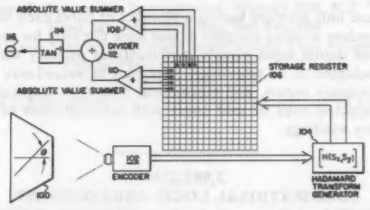
means for associating said error vectors e_{ni} and e_{nj} with the data tracks i and j respectively; and

said data correction matrix receiving uncorrected data and said error vectors and combining said data and said vectors to invert the polarity of erroneous bits of said uncorrected data in accordance with the characteristics of said error vectors.

3,982,227
PATTERN RECOGNITION MACHINE FOR ANALYZING LINE ORIENTATION

Reuben E. Joynson, Alplaus, and Joseph L. Mundy, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 2, 1975, Ser. No. 582,689
Int. Cl.² G06K *9/00*
U.S. Cl. 340—146.3 AE **18 Claims**



1. A computing machine for determining the angle of line and edge information from a two-dimensional data scene, comprising in combination:

first data means for producting a first signal representative of the sum of a first set of two dimensional Hadamard transform coefficients of a scene, said first set consisting of the Hadamard transform coefficients having a sequency of one along a first axis of said scene and sequencies of two, three, four, and five along a second axis of said scene;

second means for producing a second signal representative of the sum of a second set of two-dimensional Hadamard transform coefficients of said scene, said second set consisting of the Hadamard transform coefficients having a sequency of one along said second axis of said scene and sequencies of two, three, four and five along said first axis of said scene;

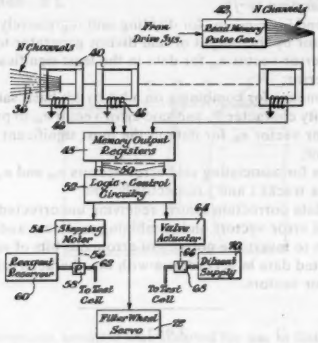
dividing circuit means for producing a third signal representative of the quotient of said first signal divided by said second signal;

arctangent calculating circuit means for producing an output signal proportional to the arctangent of said third signal, whereby said output signal is representative of the angle of line and edge information in said scene with said first axis.

3,982,228
PROGRAMMABLE CONTROLLER

Vincent W. Bankoski, Jr., Newark, Del., assignor to E. I. Du-Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 7, 1975, Ser. No. 602,752
Int. Cl.² G05B 19/02; G06F 1/00; G11C 11/06
U.S. Cl. 340—172.5 10 Claims



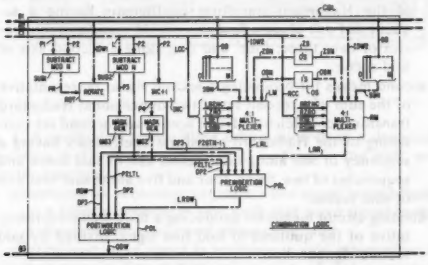
1. In a process controller for controlling various routines and sub-routines of a process operated in accordance with different program inputs, said controller having mechanisms for effecting said sub-routines, logic circuitry responsive to digital input signals for controlling said mechanisms, and a programmer responsive to said program inputs for generating said digital signals thereby to control said routines and sub-routines, the improvement wherein said programmer comprises:

a read only memory having a plurality of cores each having a secondary winding coupled to said logic circuitry for providing said digital input signals, a plurality of primary winding each adapted to be selectively energized in accordance with said program inputs, and mechanical means to magnetically link selected ones of said cores with selected ones of said primary windings.

3,982,229
COMBINATIONAL LOGIC ARRANGEMENT

David Michael Rouse, Columbus, Ohio, and Betty Ann Sproule, Odessa, Tex., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 8, 1975, Ser. No. 539,328
Int. Cl.² G06F 7/00
U.S. Cl. 340—172.5 11 Claims



11. In a data processor including control means for specifying option instructions which define at least one of a plurality of logical operations, combinational logic circuit comprising

a subtractor circuit responsive to the bit position of a start bit of a quantum of bits in an input data word and to an indication of the intended bit position of the start bit in an output data word for generating a rotate indication defining the number of bit positions that the quantum must be rotated,

a rotate circuit responsive to the rotate indication and to said input data word for rotating said input data word the number of bit positions indicated by said rotate indication,

first and second mask generators for respectively generating masks for bit positions before and after the quantum in the output data word,

first and second multiplexers responsive to said option instructions for respectively generating the bit values of the bit positions of the output data word before and after the quantum in the output data word,

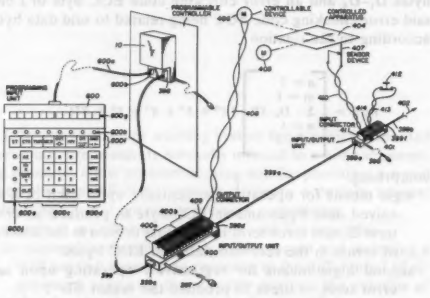
a first insertion logic circuit responsive to said masks and to said bit values generated by said multiplexers for generating a logical result data word with said bit values in the bit positions before and after the quantum in the output data word, and

a second insertion logic circuit responsive to said logical result data word, said masks and said rotated input data word for generating an output data word with the quantum in the defined rotated position and the generated bit values in the bit positions before and after the quantum.

3,982,230
PROGRAMMABLE LOGIC CONTROLLER WITH FLAG STORAGE

Bobby G. Burkett, Richardson, and Raymond W. Henry, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 7, 1974, Ser. No. 431,589
Int. Cl.² G06F 3/06
U.S. Cl. 340—172.5 7 Claims



1. In a programmable controller for selectively connecting and disconnecting an alternating current power signal to each of *m* output devices in response to computed respective on/off states generated by execution of a control program stored in a memory means on *n* binary parameters, wherein the value of each of said parameters corresponds to the on/off state of a respective input device, the combination which comprises:

a. a readable and writable image register having at least *m* + *n* single bit storage locations for temporarily storing a set of said *n* binary parameters and a set of on/off states for said *m* output devices;

b. timing means responsive to said alternating current power signal for generating an initiate input/output control signal once each half cycle of said power signal;

c. means coupled to said timing means and responsive to said initiate input/output control signal for writing and reading single bit words into and out of said image register, said means including:

i. sampling means for sampling the on/off states of said *n* input devices and generating a set of *n* respective single bit binary parameters corresponding to the on/off state of said input devices when an initiate input/output control signal is received;

ii. first transfer means for serially writing said *n* single bit binary parameters generated by said sampling means into said image register; and

iii. second transfer means for serially reading *m* single bit previously computed on/off states for said output devices out of said image register means for transmission to said output devices; and

d. computing means coupling to said memory means and to said image register and responsive to said control program and to said single bit binary parameters for computing the on/off states of the output devices.

3,982,231

PREFIXING IN A MULTIPROCESSING SYSTEM

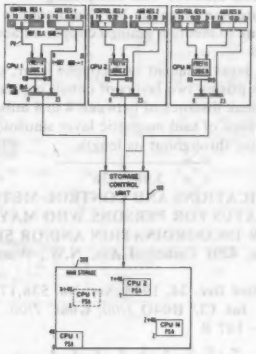
William A. Bernstein, Kingston, and Robert H. Doggett, Ulster Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 239,894, March 31, 1972. This application Apr. 16, 1974, Ser. No. 461,336

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.[2] G06F *1/00*

U.S. Cl. 340—172.5 **4 Claims**



1. In a shared storage multiprocessing system that includes a plurality of processors and an addressable storage arranged into blocks of storage for storing blocks of data, a method by which each of said processors may access all of said blocks of data comprising the steps of:

providing a prefix number for one of said processors having a zero value which is equal to the block address of a prefixed storage area consisting of a block of storage assigned to said one processor,

providing reference block addresses for said one processor,

detecting the zero value of said prefix number and the values of said reference block addresses provided for said one processor,

providing storage block addresses for said one processor for accessing all of said blocks of data in accordance with the detected values including:

a storage block address having a value which is equal to the zero value of the prefix number provided for said one processor for accessing the block of data in the prefixed storage area assigned to said one processor when the reference block address having a value which is equal to zero is detected, and

other storage block addresses having values which are equal to the reference block addresses provided for said one processor for accessing blocks of data other than the block of data contained in the prefixed storage area assigned to said one processor when reference block addresses having values which are greater than zero are detected,

providing prefix numbers for the remaining processors having different predetermined values which are greater than zero and equal to the block addresses of different prefixed storage areas consisting of blocks of storage assigned to said remaining processors,

providing reference block addresses for each of said remaining processors,

detecting the predetermined value of the prefix number and the values of the reference block addresses provided for each of said remaining processors, and

providing storage block addresses for each of said remaining processors for accessing all of said blocks of data in accordance with the detected values including:

a first storage block address having a value which is equal to the predetermined value of the prefix number provided for said remaining processor for accessing the block of data in the prefixed storage area assigned to said remaining processor when the reference block address having a value which is equal to zero is detected,

a second storage block address having a value which is equal to zero for accessing the block of data in the prefixed storage area assigned to said one processor when the reference block address having a value which is equal to the predetermined value of the prefix number provided for said remaining processor is detected, and

other storage block addresses having values which are equal to the reference block addresses provided for said remaining processor for accessing blocks of data other than the blocks of data in the prefixed storage areas assigned to said one processor and said remaining processor when reference block addresses having values which are greater than zero and not equal to the predetermined value of the prefix number provided for said remaining processor are detected.

3,982,232

TRAFFIC USAGE DATA GATHERING APPARATUS

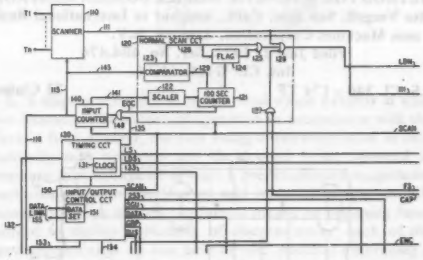
Richard Henry Etra, Forest Hills, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 16, 1975, Ser. No. 541,496

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.[2] G06F *1/00*

U.S. Cl. 340—172.5 **16 Claims**



1. Apparatus for gathering data pertaining to the status of each of a plurality of inputs comprising, means for scanning said plurality of inputs in succession, individual means associated with each of said inputs for storing control information associated with each said input, and control means operable with said scanning means for gathering said data from each of said inputs in accordance with said control information associated with each said input.

3,982,233
CORE MEMORY WITH IMPROVED SENSE-INHIBIT RECOVERY TIME

Rex John Crookshanks, Palos Verdes Estates, Calif., assignor to Ampex Corporation, Redwood City, Calif.

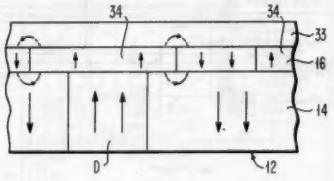
Filed Feb. 19, 1974, Ser. No. 443,712
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.² G11C *7/02, 11/06*
U.S. Cl. 340—174 DC **24 Claims**

1. A magnetic core memory comprising at least one array of magnetic cores;
a plurality of conductors inductively coupled for selectively switching cores in the array and for sensing output voltage signals generated by selectively switched cores;
a sense amplifier coupled to at least one of said conductors to sense output voltage signals generated thereon by selectively switched cores; and
a non-linear electrical circuit connected to the at least one conductor to modify electric signals appearing thereon, said electrical circuit being connected to the one conductor at a position intermediate the array with the one conductor being inductively coupled to magnetic cores of the array on each side of the connection position and with magnetic cores inductively coupled to the conductor on at least one side of the connection being disposed along the conductor between the connection position and the sense amplifier, said conductor being coupled to carry current between a current source and a current sink with a connection position and cores inductively coupled to the conductor on both sides thereof being disposed between the current source and current sink.

3,982,234
HARD-MAGNETIC FILM OVERLAY APPARATUS AND METHOD FOR MAGNETIC MOBILE DOMAIN CONTROL

Otto Voegeli, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 1, 1974, Ser. No. 484,476
Int. Cl.² G11C *11/14*
U.S. Cl. 340—174 TF **25 Claims**

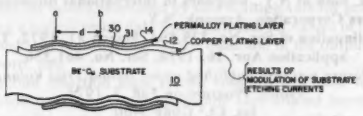


1. A single-wall magnetic domain arrangement comprising:
a first layer of materials in which mobile magnetic domains can be moved;
a second layer of magnetically hard material placed contiguous to a surface of said first layer; and
stationary magnetic domains in said second layer arranged in a permanent arbitrarily selected control configuration to provide a predetermined path substantially independent of the bias field for the movement of the mobile domains in said first layer.

3,982,235
SINUSOIDAL FILM PLATED MEMORY WIRE

Charles Bennett, Framingham, and Emil Toledo, Newton, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 28, 1974, Ser. No. 501,305
Int. Cl.² G11C *11/155*
U.S. Cl. 340—174 PW **5 Claims**

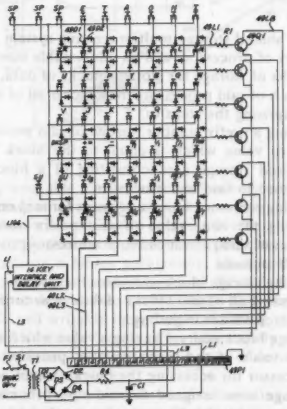


1. A magnetic memory wire comprising:
an inner core non-magnetic beryllium-copper substrate;
a layer of fine to medium grained copper adjacent said inner core; and
a magnetic layer adjacent said copper layer, said magnetic layer comprising two layers of cobalt permalloy having a peak to peak distance of between 4 to 8 mils, wherein the outer surface of said magnetic layer sinusoidally changes in diameter throughout its length.

3,982,236
COMMUNICATIONS AND CONTROL METHOD AND APPARATUS FOR PERSONS WHO MAY HAVE MUSCULAR INCOORDINATION AND/OR SPASTICITY

Haig Kafafian, 4201 Cathedral Ave. N.W., Washington, D.C. 20016

Filed Dec. 24, 1974, Ser. No. 536,176
Int. Cl.² H04Q *3/00;* **G06C** *7/00*
U.S. Cl. 340—147 R **3 Claims**



1. A method of communication and/or control for persons who are handicapped including reducing the probability of error due to insufficient motor control, muscular incoordination spasticity and the like, comprising:
a. establishing for every function in a multiplicity of functions a unique combination of designators;
b. generating a pair of complete man-machine language output signals representative of two of said unique designators;

c. providing at least one actuatable interface means for selectively generating said output signals upon at least a dual actuation of said input interface means;

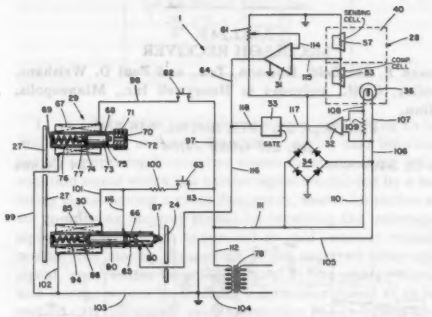
d. connecting utilization means to the pair of output signals for producing a function commensurate with actuation of said input interface means,

e. disabling said producing means for a time delay interval which may be selectively varied whereby said producing means is rendered impervious to subsequent actuations of said input interface means prior to expiration of the time delay so that spastic or other extraneous movements by the handicapped operator causing inadvertent actuations of said input interface means do not produce undesired functions.

3,982,237
COMBINATION DOOR CHIME AND PARTICULATE PRODUCTS OF COMBUSTION DETECTOR

David J. Conville, Libertyville, and Burke J. Crane, Lombard, both of Ill., assignors to Rixson-Firemark, Inc., Franklin Park, Ill.

Filed Feb. 28, 1975, Ser. No. 553,907
Int. Cl.² G08B 17/10
U.S. Cl. 340—237.5 **9 Claims**



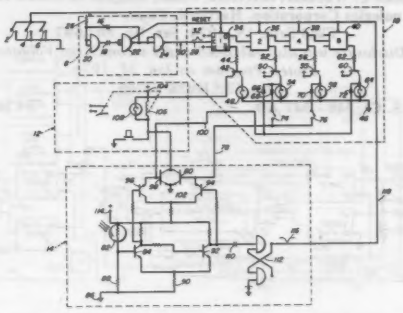
1. In a door chime having a pair of spaced tone bars and an associated tone bar striker mechanism with the striker mechanism being capable of single-note two-note, and sustained-repetitive note striking of the tone bars, and a cover having access openings enabling particulate products of combustion to pass therethrough, the improvement comprising a detector for the particulate products of combustion located within the door chime and at least substantially obscured by the cover, and means electrically interconnecting the tone bar striker mechanism with the detector to actuate the striker mechanism to a state of sustained-repetitive two-note striking of the tone bars in response to the detection of the particulate products of combustion by the detector.

3,982,238
TIME BASED MONITORING SYSTEM

William L. Byers, Glidden St., Newcastle, Maine 04553

Filed Aug. 22, 1974, Ser. No. 499,399
Int. Cl.² G08B 21/00
U.S. Cl. 340—279 **9 Claims**

1. A monitoring system for the notification of locations external to the monitored area of a prelonged absence of normal human ambulatory mobility within the monitored area, comprising in combination a resettable clock adapted to give a continuing sequence of electrical pulses at known time intervals, a counter adapted to count said pulses and to give an output signal when the number of pulses counted reaches a predetermined number; one or more reset switches directly responsive to normal human ambulatory mobility adapted to directly reset said clock and counter; said reset switches being located in geographic locations independent of the person of the monitored individual; said geographic locations being so

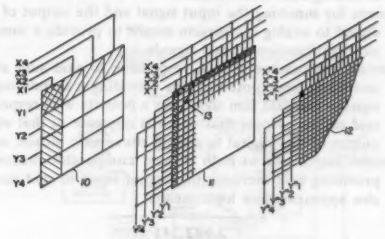


chosen that the reset switches will not function in the absence of normal human ambulatory mobility; and an alarm responsive to said output signal.

3,982,239
SATURATION DRIVE ARRANGEMENTS FOR OPTICALLY BISTABLE DISPLAYS

Solomon Sherr, Hartsdale, N.Y., assignor to North Hills Electronics, Inc., Glen Cove, N.Y.

Continuation-in-part of Ser. No. 330,227, Feb. 7, 1973, Pat. No. 3,848,247. This application July 22, 1974, Ser. No. 490,556
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 M **19 Claims**



1. A display assembly using material which exhibits at least two characteristic modes of operation in accordance with the electric field applied, the first being a quiescent state at substantially zero potential and the second being assumed in response to a voltage of at least a predetermined magnitude, comprising: the assemblage of said material in substantially planar form with spaced conductive means on opposing faces thereof to define a plurality of discrete areas, each of the conductive means on one side of said material embracing a first plurality of discrete areas, each of the conductive means on the other side of said material embracing a second plurality of said discrete areas, and each one of said second plurality of areas appearing within a different one of said first plurality of areas; and control means operative to establish a substantially zero potential between the conductive means of preselected discrete areas, to establish a potential of a first polarity and at least said predetermined magnitude on the remaining conductive means of said first plurality, and to establish a potential of the opposite polarity and at least said predetermined magnitude on the remaining conductive means of said second plurality.

3,982,240

BIPOLAR A/D CONVERTER USING TWO COMPARATORS

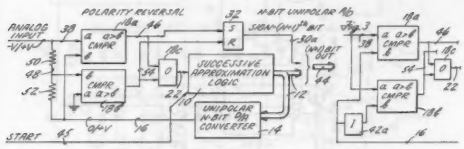
Glenn C. Waehner, Riverside, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sept. 19, 1974, Ser. No. 507,647

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² H03K *13/06*

U.S. Cl. 340—347 AD **3 Claims**



1. Bipolar analog to digital conversion apparatus for providing a digital manifestation of an analog input signal, comprising:

successive approximation logic means for providing a digital output signal manifestation, said means responsive to an incrementing input signal to increment the digital value at its output;

digital to analog conversion means responsive to the output of said successive approximation logic means for providing an output signal which comprises an analog manifestation of the value of the digital output of said successive approximation logic;

first comparator means, responsive to the analog input signal and to the output of said digital to analog conversion means, for providing a first output signal indicative of the analog input signal being of the same polarity as and greater in magnitude than the output of said digital to analog conversion means;

means for summing the input signal and the output of said digital to analog conversion means to provide a sum-signal manifestation of said signals;

second comparator means, responsive to said sum signal and a reference potential, for providing a second output signal when said sum signal has a polarity with respect to said reference potential which is opposite to that of the output of said digital to analog conversion means; and

means responsive to both of said comparator means for providing said incrementing signal input to said successive approximation logic means.

3,982,241

SELF-ZEROING ANALOG-TO-DIGITAL CONVERSION SYSTEM

Jesse B. Lipcon, Brighton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 19, 1974, Ser. No. 498,500

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 CC **30 Claims**

13. An analog-to-digital conversion system for converting analog inputs into coded digital numbers, said system comprising:

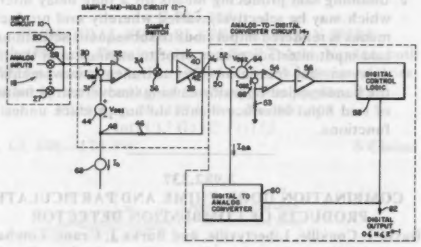
A. means for selecting one of a plurality of said analog inputs;

B. a sample and hold circuit for storing an input analog voltage;

C. a conversion circuit for quantifying said analog voltage into a digital number;

D. comparing means shared by said sample and hold circuit and said conversion circuit for comparing voltages; and

E. switching means for switching said system, said switching means when in a first position enabling said comparing means to compare a voltage from said analog input to a voltage from said sample and hold circuit, said switching means when in a second position enabling said comparing means to compare a voltage from said conversion circuit to a voltage established by said comparing means when



said switching means was in said first position; wherein the offset errors in said analog-to-digital conversion system are cancelled such that said system is substantially self-zeroing.

3,982,242

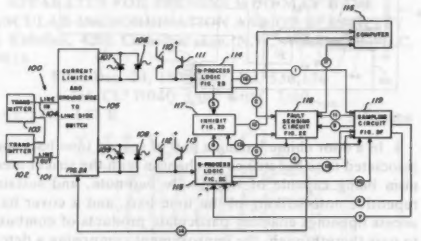
McCULLOH RECEIVER

Herman E. Sheffield, Houston, Tex., and Paul D. Welshans, Pedley, Calif., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 23, 1975, Ser. No. 616,113

Int. Cl.² G08B *24/00*

U.S. Cl. 340—409 **24 Claims**



1. A receiver for receiving coded signals on a McCulloh loop having a line out side connected to a first terminal of a source of current and a line in side connected to a second terminal of the source at ground, said receiver for providing to a computer an output having a single polarity regardless of the polarity of said coded signals, said receiver comprising:

N process logic circuit means for receiving said coded signals on said line out side and for providing a single polarity first output regardless of the polarity of said coded signals;

G process logic circuit means for receiving said coded signals on said line in side and for providing a single polarity second output regardless of the polarity of said coded signals;

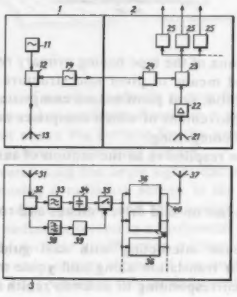
fault sensing circuit means connected to said N and G process logic circuit means for providing a third output indicative of a fault condition on said loop and for connecting said line in side from said second terminal to said first terminal of said source upon the occurrence of a fault condition; and,

wherein said first, second and third outputs are supplied to a computer to provide an indication of said coded signals and said fault condition.

3,982,243
DEVICE FOR TRANSMISSION OF INFORMATION FROM AN INFORMATION EMITTER TO AN INFORMATION SEEKER

Per-Olof Gerhard Gustavsson, Pixbo, and Bo Anders Morwing, Molndal, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Nov. 5, 1974, Ser. No. 520,975
Claims priority, application Sweden, Nov. 30, 1973, 7316256
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.5 R **6 Claims**



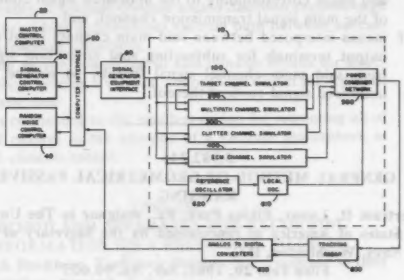
1. An information transmission system comprising an information emitter and an information seeker; said information seeker comprising transmitter means for transmitting an interrogation signal which is a carrier signal modulated by a modulating signal having a given frequency; said information emitter comprising receiver means for receiving the interrogating signal, storage means connected to said receiver means for temporarily storing the energy in the received interrogating signal, and emitter means energized by the energy stored in said storage means for emitting information pulses of an information carrying signal, said information pulses having a repetition rate related to said given frequency and components which are simultaneously damped oscillations of specific frequencies; and said information seeker further comprising further receiver means for receiving said information pulses of information carrying signal, modulator means for modulating said information pulses of information carrying signal with a signal having a frequency which is an integral multiple of said given frequency, and a plurality of frequency sensitive detector means, connected in parallel with said modulator means, for detecting different ones of said information pulses of information carrying signal, each of said frequency sensitive detector means comprising, connected in series, a band-pass filter means for passing a signal having frequencies corresponding to one of said specific frequencies, a demodulator means, and a second filter means for passing signals having said given frequency of the modulating signal.

3,982,244
RADAR ANTENNA, MONOPULSE COMPARATOR NETWORK AND MIXER SIMULATOR

Robert C. Ward, Huntsville, and Franklin M. Waddle, Hartselle, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 30, 1975, Ser. No. 591,925
Int. Cl.² G01S 9/02, 7/40, 9/22
U.S. Cl. 343—16 M **6 Claims**

1. A radar antenna, monopulse comparator network, and mixer simulator comprising: a plurality of channel simulators, each of said channel simulators having separate sum, azimuth difference, and elevation difference output signals; each of said channel simulators having plural inputs for providing control signals thereto; a power combiner network having inputs coupled to receive said channel simulator output signals for combining like signals from the respective channels,

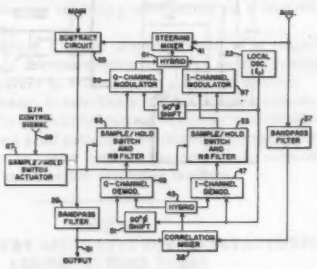


said combiner network having respective composite outputs of said sum azimuth difference and elevation difference signals for coupling to radar tracking intermediate frequency circuits.

3,982,245
SIDELOBE CANCELLER WITH PROGRAMMABLE CORRELATION SIGNAL WEIGHTING

Hendrick H. Soule, Jr., Marcellus, and John F. Jureller, Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed July 15, 1974, Ser. No. 488,395
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.² G01S 3/06
U.S. Cl. 343—100 LE **8 Claims**



1. In a canceller:
a. a main signal transmission channel having an output terminal and an input terminal coupled to receive a signal which may include both desired and undesired signal content;
b. an auxiliary signal transmission channel coupled to receive a signal including primarily said undesired signal;
c. cross correlation means connected to the output terminal of said main signal transmission channel and to said auxiliary signal transmission channel for detecting the relative amplitude and phase of said main and auxiliary channel signals and generating a correlation signal indicative of the result of such correlation;
d. correlation signal processing means including narrowband filter means and switch means connected in series relation, said switch means being selectively operable to pass the correlation signal generated by said cross correlation means;
e. a compensating cross feed network coupled to said auxiliary signal transmission channel to receive said undesired

signal and to said correlation signal processing means to receive the correlation signal as processed thereby, said cross feed network being responsive to the signals coupled thereto to generate a correction signal of amplitude and phase corresponding to the undesired signal content of the main signal transmission channel; and

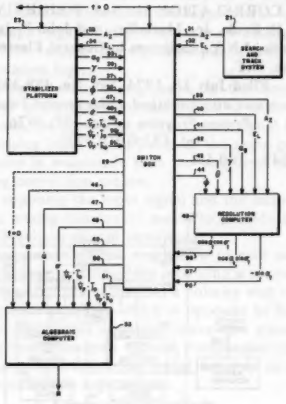
f. means interposed between said main channel input and output terminals for subtracting said correction signal from said main channel signal thereby to reduce the undesired signal content thereof.

3,982,246

GENERAL METHOD OF GEOMETRICAL PASSIVE RANGING

Bertram H. Lubar, Elkins Park, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 20, 1961, Ser. No. 90,605
Int. Cl.² G01S *11/00*
U.S. Cl. 343—112 C **7 Claims**



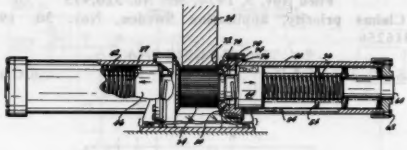
2. A system carried by a fighter for passively determining range between the fighter and a radiation emitting target travelling at a constant velocity, comprising in combination: a search and track antenna system operable to generate signals proportional to the azimuth and elevation angles of the line of sight to the target with respect to the coordinate system of the fighter, a stabilized platform for defining an inertial reference coordinate system, said stabilized platform being slaved to said search and track system and responsive to said azimuth and elevation signals to determine and generate signals proportional to angular and angular rate deviations of the line of sight from said inertial reference system, said stabilized platform including means for generating signals proportional to fighter acceleration components along the axes of said inertial reference system, resolver means connected to said stabilized platform operable to transform said angular and angular rate signals and said acceleration component signals into terms of said inertial reference coordinate system, means coupled to said resolver operable to determine and display the range between said fighter and said target.

3,982,247

ANTENNA SPRING COUNTERWEIGHT

Kurt Simoneit, Poway, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Apr. 9, 1975, Ser. No. 566,242
Int. Cl.² H01Q *3/02*
U.S. Cl. 343—766 **24 Claims**



1. In an antenna of the type having primary reflective structure means and means to pivot said structure means in the elevation direction, said pivot means comprising drive motor means, the improvement of which comprises inertia counterbalance means comprising:

driven means responsive to the motion of said drive motor means;

a housing;

guide means fast on said driven means and rotatable in said housing;

follower means interacting with said guide means and adapted for translation along said guide means between positions corresponding to antenna zenith and horizontal elevation positions; and

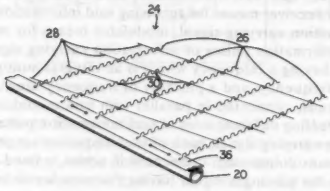
resilient means within said housing and alternately compressed and relaxed by the movement of said follower means.

3,982,248

COMPLIANT MESH STRUCTURE FOR COLLAPSIBLE REFLECTOR

John S. Archer, Palos Verdes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed July 1, 1974, Ser. No. 484,635
Int. Cl.² H01Q *15/16, 15/20*
U.S. Cl. 343—840 **11 Claims**



1. A structure comprising:

a supporting frame having spaced supporting members;

a wire mesh panel positioned between said members including parallel first wires extending linearly the full distance between and terminally secured to said members, parallel second wires totally distinct from said first wires disposed in crossing realtion to said first, and means joining said first and second wires at their crossing points, whereby said first wires have segments extending between said second wires;

said first wires being parallel and having a generally spring-like configuration along their full length between said members such that said first wire segments are resiliently extensible and contractable in their endwise direction; and

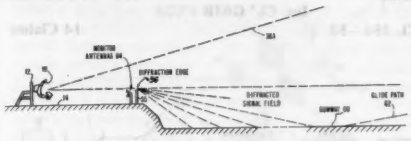
said compliant first wires being under a predetermined preload.

3,982,249

MICROWAVE RADIATION METHOD AND APPARATUS WITH A COMBINED DIFFRACTION EDGE AND RADIATION SCREEN

Donald J. Toman, Pleasantville, N.Y., assignor to Tull Aviation Corporation, Armonk, N.Y.

Filed May 30, 1975, Ser. No. 582,204
Int. Cl.² H01Q 15/02, 1/52
U.S. Cl. 343—841 15 Claims



1. In the operation of a radio guidance system for transmitting directional microwave guidance signals in a pattern generally along and just above the horizon for the azimuth guidance portion of an instrument landing system,

the method of overcoming low angle signal distortion problems by interposing a radiation screen in the low angle portion of the signal pattern and terminating the upper portion of the radiation screen in a horizontal diffraction edge to thereby provide a diffraction pattern of azimuth guidance microwave energy signals at low angles beyond the diffraction edge which is substantially undistorted in azimuth,

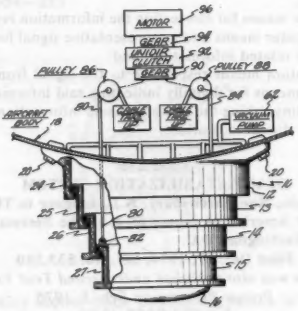
said diffraction pattern replacing the original low angle portion of the signal pattern intercepted by the radiation screen.

3,982,250

RETRACTABLE RADOME

Carl J. Giannatto, Satellite Beach, Fla., and Theodore Watkin, Stamford, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 15, 1975, Ser. No. 622,791
Int. Cl.² H01Q 1/42
U.S. Cl. 343—872 2 Claims



1. A retractable radome, comprising:

at least two casing means, each having a cavity extending therethrough along a common longitudinal axis, said casing means being of successively smaller dimensions for nesting of a smaller dimension casing within a next adjacent larger dimension casing to permit relative mobility of adjacent casings in a coaxial telescoping manner from a fully retracted to a fully extended coaxial position, each of said casing means including inner wall surface means and outer wall surface means, the outer wall surface means of a smaller dimension casing and the inner wall surface means of a next adjacent larger dimension casing being relatively disposed in a vacuum sealing relationship for providing a vacuum chamber therebetween, said inner and outer wall surface means of each casing defining a central area therebetween, said central area having a plurality of vacuum conduit means disposed therethrough for providing a continuous vacuum path between successive vacuum chambers;

vacuum means connected to said conduit means for selectively providing a vacuum atmosphere within said conduit means; and

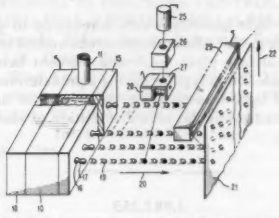
means connected to the smallest casing for retracting all of said casings in the absence of a vacuum atmosphere in said conduit means.

3,982,251

METHOD AND APPARATUS FOR RECORDING INFORMATION ON A RECORDING MEDIUM

Frederick Hochberg, Yorktown Heights, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 499,884, Aug. 23, 1974, abandoned.
This application May 6, 1975, Ser. No. 575,094
Int. Cl.² G01D 15/18
U.S. Cl. 346—1 52 Claims



1. An apparatus for recording information on a recording medium including:

means to produce a liquid stream formed of a material sensitive to a selected source of energy so as to change from transparent to a color when subjected thereto;

and selector means to selectively subject various portions of the stream to the selected source of energy in accordance with a desired print pattern to be recorded on the recording medium to cause each of the selectively subjected portions to print on the recording medium.

3,982,252

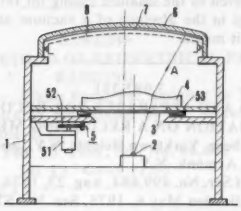
LIGHT EXPOSURE APPARATUS FOR MANUFACTURING COLOR PICTURE TUBES

Eiichi Yamazaki, Ichihara; Koichi Maruyama, Mobara; Toshio Ueda, Mobara; Hiroshi Yokomizo, Mobara, and Iwao Ogura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 22, 1974, Ser. No. 499,563
Claims priority, application Japan, Aug. 29, 1973, 48-96096; Aug. 29, 1973, 48-96097
Int. Cl.² G03B 41/00
U.S. Cl. 354—1 9 Claims

1. In a light exposure apparatus of the class having a light source, an illumination intensity correcting filter, an exposing light path correction lens, a face plate provided with a colour selection electrode of a colour picture tube, and a casing wherein said light source, said illumination intensity correcting filter and said exposing light path correction lens are disposed in said casing by taking a predetermined position, and said face plate is removably disposed on the top portion of said casing so as to be exposed to light from said light source said illumination intensity correcting filter and said exposing light path correction lens, the improvement wherein

said illumination intensity correcting filter is formed as an assembly of individual elements, said elements being sufficient in number to obtain the number of desired elemental changes in light transmissivity required for exposing the area of said screen, each of said elements operable to provide a region restricting light transmission therethrough corresponding to



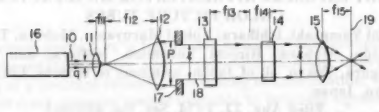
the exposure light quantity which is required to expose the corresponding part of a fluorescent screen coated on the inner surface of said face plate, each said element being formed discretely, each of said regions having a predetermined particular value of light transmissivity distributed in accordance with the desired elemental area distribution of said exposure light quantity.

3,982,253

OPTICAL SYSTEM FOR OBTAINING LINEAR IMAGE AND RECORDED DEVICE UTILIZING THE OPTICAL SYSTEM

Takeshi Goshima, Tokyo, and Kiyonobu Endo, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1975, Ser. No. 554,196
Claims priority, application Japan, Mar. 4, 1974, 49-25563
Int. Cl.² G03B *41/00*
U.S. Cl. 354—4 **8 Claims**



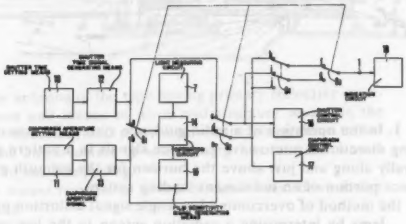
1. A linear image composition device comprising:
a beam generator means for generating a beam;
a first rectangular beam producing means for causing the beam generated by said beam generator means to be a first parallel light beam with rectangular cross section;
a second rectangular beam producing means for producing a second parallel light beam with rectangular cross section the ratio of the length and breadth of which exceeds that of said first parallel light beam, said second parallel light beam being produced from said first parallel light beam by using a plurality of lenses; and
a beam converging means to which the second parallel light beam with rectangular cross section is applied.

3,982,254

DIGITAL INDICATION SYSTEM FOR A CAMERA

Tadashi Ito, Kanagawa; Soichi Nakamoto, Machida, and Sadao Yamada, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Tokyo Shibaura Electric Co., Ltd., both of, Japan

Filed Mar. 24, 1975, Ser. No. 561,624
Claims priority, application Japan, Mar. 29, 1974, 49-35772
Int. Cl.² G03B *17/20*
U.S. Cl. 354—53 **14 Claims**



1. An indication system of a camera comprising:
a. a shutter time setting means;
b. a shutter time signal generating means coupled with said shutter time setting means to generate a shutter time signal;
c. a diaphragm aperture setting means;
d. a diaphragm aperture signal generating means, coupled with said diaphragm aperture setting means to generate a diaphragm aperture signal;
e. a first switching means responsive to said shutter time signal and said diaphragm aperture signal, for selecting one of said signals and for supplying said selected signal as an output signal; and
f. an indication circuit responsive to the output of said first switching means and having:
a register means being coupled to the output of said first switching means for memorizing and reading out digital information being supplied from said first switching means,
a decoder means for converting the information read out by the register means into a representative signal for indicating the related information, and
an indication means responsive to the signal from the decoder means for digitally indicating said information and for distinguishing the content of said information in a part of said digital indication.

3,982,255

IMAGE STABILIZATION SYSTEM

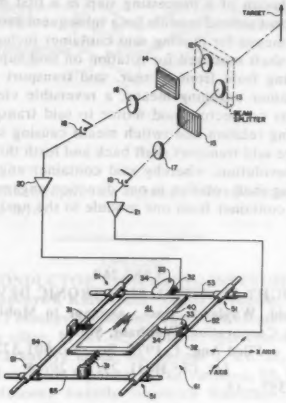
Carl Orlando, New Shrewsbury, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 17, 1974, Ser. No. 533,580
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976
Int. Cl.² G03B *39/00*
U.S. Cl. 354—70 **5 Claims**

1. An image stabilization system for maintaining a fixed relationship between a target to be photographed and an image of the target to be recorded on a photographic film comprising:
a. a primary lens system for receiving light rays from said target and for splitting said light rays into first and second light beams;
b. first and second optical density wedges each having a scale of continuous linear density gradations, said wedges being positioned with their respective scales at angles to each other and in position for said first wedge to transmit

said first light beam and said second wedge to transmit said second light beam;

c. first and second photo-electric means responsive to said first and second transmitted light beams, respectively, for producing variable first and second output voltages; and



d. means responsive to said first and second output voltages for moving said photographic film in all directions on a given plane in consonance with the variations in said first and second output voltages.

3,982,256

ROTARY SHUTTER BLADE MECHANISM FOR CAMERAS

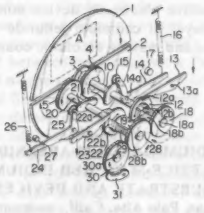
Sachio Ohmori, and Shuji Kimura, both of Yokohama, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed June 5, 1975, Ser. No. 583,899

Claims priority, application Japan, June 18, 1974, 49-68684

Int. Cl.² G03B 9/16

U.S. Cl. 354—253 **4 Claims**



1. A rotary shutter blade driving mechanism in which the driving energy of the rotary shutter blade is recovered by a driving spring of said shutter blade in the course of deceleration of said blade, comprising:

driving shaft means for driving the shutter blade in one direction only;

auxiliary actuating means adapted to give one-directional rotative force to said driving shaft means;

rotary cam means secured to said driving shaft means and having at its periphery at least one pair of accelerating portions and at least one pair of decelerating portions;

reciprocating lever means having an engaging portion engageable with said accelerating and decelerating portions and pivotally mounted relative to said rotary cam means;

main actuating means adapted to give to said lever means a rotative force of the direction in which said engaging portions come to contact said rotary cam means; and

means for locking said driving shaft means when respective foremost ends of said accelerating portions are engaged with said engaging portion of said lever means, wherein said accelerating portions are so designed as to receive rotating motion of said lever means caused by the urging force of said main actuating means while pressing said engaging portion against said accelerating portions for turning said cam means in said one direction when said means for locking said driving shaft means is released, while said decelerating portions are so designed as to turn said lever means, upon rotation of said cam means, through said engaging portion in the direction opposed to the urging force of said main actuating means and to let said lever means return to its original position for stopping said driving shaft means, and said cam means is so formed that the foremost end of each accelerating portion will be positioned adjacent to the rearmost end of each decelerating portion.

3,982,257

MEANS FOR ENABLING STOPPED-DOWN MEASUREMENT IN EXPOSURE CONTROL CAMERA EMPLOYING FULL-APERTURE MEASURING SYSTEM

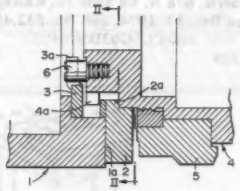
Shiyuichi Togashi, Tokyo, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Aug. 18, 1975, Ser. No. 605,232

Claims priority, application Japan, Aug. 19, 1974, 49-98354[U]; Aug. 19, 1974, 49-98356[U]

Int. Cl.² G03B 9/06, 7/00

U.S. Cl. 354—286 **7 Claims**



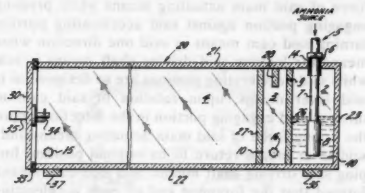
1. In a photographic single lens reflex camera provided with a full-aperture measurement type exposure control device and having a diaphragm interlocking member which is connected with a variable resistor to control the exposure in accordance with information concerned with the diaphragm, means for enabling stopped-down measurement when an interchangeable lens is mounted to the camera body comprising a first mount means formed on the end face of the camera body, a second mount means formed on the end face of the interchangeable lens to be engaged with said first mount means for securing the lens to the camera body by rotating the lens, a pin fixed to the lens and brought into engagement with the diaphragm interlocking member to move the diaphragm interlocking member to a full-aperture position when the lens is rotated to be secured to the camera body, and a diaphragm operating member provided in the interchangeable lens which is manually operable to stop down the diaphragm.

3,982,258

PHOTOGRAPHIC PLATE DEVELOPER APPARATUS

Walter N. Czebiniak, Sunnyvale, Calif., assignor to GAF Corporation, New York, N.Y.

Filed July 1, 1974, Ser. No. 484,951
Int. Cl.² G03D 7/00
U.S. Cl. 354—300 14 Claims



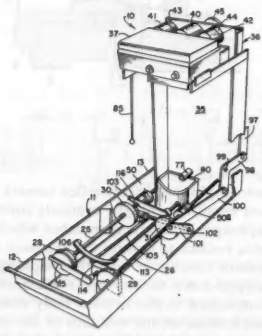
1. An apparatus for exposing sensitized photographic plates to a developer, comprising a housing, a first chamber within said housing for moisture conditioning dry developer, a second chamber within said housing for accommodating the sensitized photographic plates, means communicating between said first and second chambers for conveying said moisturized developer from said first chamber to said second chamber, means within said housing for preventing moisturized developer in the liquid state from entering said second chamber, means providing access to said second chamber for entry and removal of said plates, said means for preventing liquid developer from entering said second chamber comprising a trap having first conveying means communicating with said first chamber and second conveying means communicating with said second chamber, said means communicating between said first and second chambers being formed by said first and second conveying means, said trap having a first wall common with said first chamber and a second wall common with said second chamber.

3,982,259

PHOTOGRAPHIC MATERIAL PROCESSING MODULE

Edward Van Baerle, 676 N. La Salle St., Chicago, Ill. 60610

Filed Dec. 13, 1974, Ser. No. 532,452
Int. Cl.² G03D 3/04
U.S. Cl. 354—329 6 Claims



1. A photographic material processing module usable with a like module arranged in adjacent side-by-side relation, comprising:

a support having front and rear portions;

a cylindrical container for holding photographic material on the inside thereof, said container including a front cover and a rear cover having an opening for receiving and discharging processing liquids;

means on said support for positioning said container horizontally and for imparting processing movements thereto;

means on said support for feeding processing liquid into said container;

means on said support for discharging liquid from said container; and

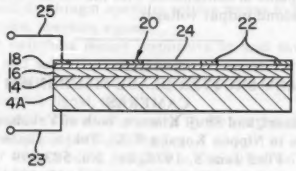
means on said support for moving said container at the conclusion of a processing step in a first module to an adjacent second module for a subsequent processing step, said means for moving said container including a transport shaft mounted for rotation on said support and extending from front to rear, said transport shaft having container engaging means, a reversible electric motor, means connecting said motor to said transport shaft in driving relation and switch means causing said motor to rotate said transport shaft back and forth through a quarter revolution, whereby said container engaging means during shaft rotation in one direction engages and moves said container from one module to the next.

3,982,260

LIGHT SENSITIVE ELECTRONIC DEVICES

Fritz Wald, Wayland, Mass., assignor to Mobil Tyco Solar Energy Corporation, Waltham, Mass.

Filed Aug. 1, 1975, Ser. No. 601,327
Int. Cl.² H01L 27/14, 29/48
U.S. Cl. 357—15 10 Claims



1. A light sensitive electronic device comprising an iron substrate and a layer of cadmium telluride having one side thereof bonded to and making an ohmic connection with said iron substrate.

3,982,261

EPITAXIAL INDIUM-GALLIUM-ARSENIDE PHOSPHIDE LAYER ON LATTICE-MATCHED INDIUM-PHOSPHIDE SUBSTRATE AND DEVICES

George A. Antypas, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

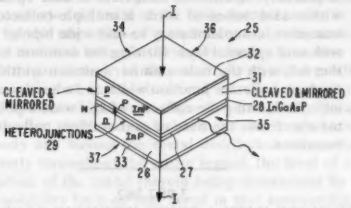
Continuation of Ser. No. 291,457, Sept. 22, 1972, abandoned.
This application Aug. 12, 1974, Ser. No. 496,487
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.² H01L 29/205, 31/00; H01S 31/19
U.S. Cl. 357—16 9 Claims

1. A lattice-matched heterojunction device comprising:

a substrate comprising a binary III-V compound of the elements indium and phosphorus and having a lattice constant falling within the range of 5.45 to 6.05 angstrons;

an epitaxial quaternary III-V layer of the compound InGaAsP joined to the surface of said substrate to form a heterojunction with said substrate, said epitaxial layer

having a lattice constant matched to within 0.5 percent of the lattice constant of said substrate to form a lattice



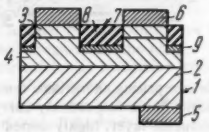
matched heterojunction between said substrate and said epitaxial layer.

3,982,262

SEMICONDUCTOR INDICATING INSTRUMENT

Anatoly Prokofievich Karatsjuba, Zeleny pereulok, 3, kv. 56, Ljubertsy-1 Moskovskoi oblasti; Tatyana Georgievna Kmita, Odesskaya ulitsa, 17, kv. 63, Moscow; Igor Ivanovich Kruglov, 15 Parkovaya ulitsa, 46, korpus 1, kv. 35, Moscow; Vladimir Ivanovich Kurinny, ulitsa Vavilova, 58, korpus 2, kv. 90, Moscow; Anatoly Ivanovich Kurnosov, prospekt Mira, 190a, kv. 20, Moscow; Igor Veniaminovich Ryzhikov, 9 Parkovaya ulitsa, 49, korpus 1, kv. 67, Moscow, and Vladimir Vasilievich Judin, Schelkovskoe shosse, 87, korpus 1, kv. 195, Moscow, all of U.S.S.R.

Filed Apr. 17, 1974, Ser. No. 461,718
Int. Cl.² H01L *33/00*
U.S. Cl. 357—17 **2 Claims**



1. A semiconductor display device consisting of a silicon-carbide crystal and comprising: an n-type conductivity region; a first diffused region of p-type conductivity; a second diffused region disposed between said regions; a first ohmic contact attached to said n-type region; several second ohmic contacts attached to said first region; light-emitting patches of which the topology is determined by the size and shape of said contacts; and an additional region of silicon carbide, incorporating clusters of structural radiation defects with a concentration of 10^{19} cm^{-3} to $10^{22}cm^{-3}$; said additional region being located between said second contacts, and the thickness whereof being about 0.5 mu larger than that of said first region.

3,982,263

INTEGRATED CIRCUIT DEVICE COMPRISING VERTICAL CHANNEL FET RESISTOR

Robert C. Dobkin, Menlo Park, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

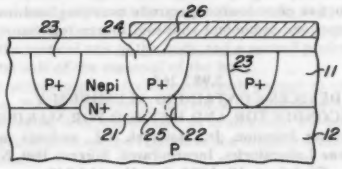
Division of Ser. No. 466,225, May 2, 1974, Pat. No. 3,886,001. This application Mar. 12, 1975, Ser. No. 557,464
Int. Cl.² H01L *29/80, 27/02, 29/34, 29/78*
U.S. Cl. 357—22 **4 Claims**

1. A channel FET resistor in the substrate of a monolithic integrated circuit device, said substrate being of a first conductivity type, said channel FET resistor comprising,

a buried layer region of a second conductivity type in the substrate, said buried layer region being band-shaped with an opening therethrough,

an epitaxial layer of said second conductivity type on said substrate and over said buried layer,

an isolation region of said first conductivity type in said epitaxial layer around said buried layer region, said isolation region extending completely through said epitaxial



layer thereby to isolate a portion of said epitaxial layer including that portion overlying said buried layer region,

a channel region of said first conductivity type in said epitaxial layer within that portion isolated by said isolation region and extending completely through said epitaxial layer, through the opening in said buried layer and into said substrate, and

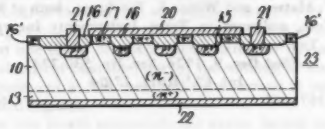
a surface contact contacting said channel region.

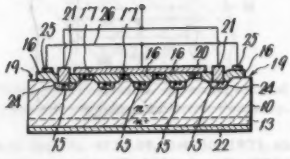
3,982,264

JUNCTION GATED FIELD EFFECT TRANSISTOR

Akiyasu Ishitani, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 384,234, July 31, 1973, Pat. No. 3,852,864. This application Jan. 27, 1975, Ser. No. 544,508
Claims priority, application Japan, Apr. 25, 1973, 48-47445
Int. Cl.² H01L *29/80*
U.S. Cl. 357—22 **11 Claims**





1. A junction gated field effect transistor having a semiconductor substrate having formed on one major surface thereof;

a drain region of low impurity concentration of one impurity type in said semiconductor substrate;

a mosaic shaped gate region in said semiconductor substrate having regions of high impurity concentration of the opposite impurity type defining a grid of bars formed on the drain region;

the portion of said semiconductor substrate lying between the bars of said grid providing channels, the length of said channels being relatively short compared to their widths;

a corresponding mosaic grid of bars of insulating material forming a layer overlying said mosaic shaped gate region and aligned therewith, the areas between the bars of said insulating layer mosaic being smaller than areas between the bars of said grid forming said gate region;

a gate electrode connected to said mosaic shaped gate region;

a plurality of semiconductor source regions of high impurity concentration of said one impurity type formed on the substrate in the areas between the bars of said grid forming the insulating layer; and

a conductive plate source electrode overlying said insulating layer and in contact with said source regions.

3,982,265

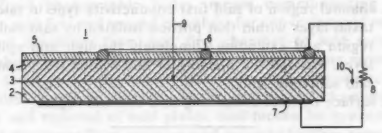
DEVICES CONTAINING ALUMINUM-V SEMICONDUCTOR AND METHOD FOR MAKING

Wilbur Dexter Johnston, Jr., Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 19, 1975, Ser. No. 614,848

Int. Cl.² H01L 27/14

U.S. Cl. 357—30 **14 Claims**



1. A p-n junction device comprising:

a first layer including III–V semiconductor;

a second layer including aluminum-V semiconductor; and

a layer of aluminum-V oxide located on said second layer.

3,982,266

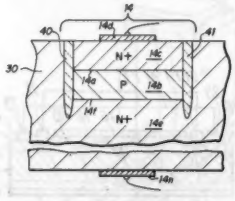
INTEGRATED INJECTION LOGIC HAVING HIGH INVERSE CURRENT GAIN

Walter T. Matzen, and Wilton L. Workman, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 9, 1974, Ser. No. 530,774

Int. Cl.² H01L 27/04

U.S. Cl. 357—44 **6 Claims**



1. A fanout logic system which comprises:

a. a heavily doped first conductivity type semiconductor substrate having a second conductivity type epitaxial layer formed on one surface thereof,

b. a wide bipolar transistor formed in said epitaxial layer with the epitaxial layer forming the collector of said transistor,

c. a pair of isolation zones extending from the surface of said epitaxial layer through the lower boundary thereof and extending laterally from the base of said transistor to isolate a portion of said epitaxial layer,

d. heavily doped first conductivity type regions between the ends of said isolation zones opposite said wide bipolar transistor, said regions extending through said epitaxial layer, and

e. a plurality of diffused collectors in said epitaxial layer within said zones to form a multiple-collector bipolar transistor, complementary to said wide bipolar transistor with said epitaxial layer forming the common base region thereof, with the base-emmiter junction width equalling the base-collector junction width and wherein said epitaxial layer forming the collector of said wide bipolar transistor also forms the base of said multiple collector bipolar transistor.

3,982,267

PIN DIODE WITH A THICK INTRINSIC ZONE AND A DEVICE COMPRISING SUCH A DIODE

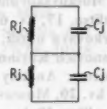
Raymond Henry, Paris, France, assignor to Thomson-CSF, Paris, France

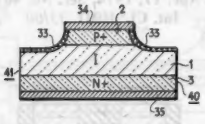
Filed Apr. 15, 1975, Ser. No. 568,363

Claims priority, application France, Apr. 16, 1974, 74.13206

Int. Cl.² H01L 29/34

U.S. Cl. 357—52 **4 Claims**





1. A PIN diode comprising an intrinsic semi-conductor plate having two opposite faces respectively carrying a first and a second semi-conductor layer, highly doped with an impurity of a given type in the case of the first layer and with a impurity of opposite type in the case of the second, and a lateral surface having a degree of roughness giving to the leakage resistance a value, lower than few hundred megohms.

3,982,268

DEEP DIODE LEAD THROUGHS

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 411,295, Oct. 30, 1973, abandoned. This application Mar. 14, 1975, Ser. No. 558,221

Int. Cl.² H01L 29/06, 27/04, 29/04, 23/48

U.S. Cl. 357—55 **29 Claims**

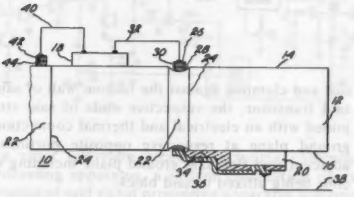
1. A semiconductor device comprising

a body of single crystal semiconductor material having first and second major opposed surfaces comprising respectively, the top and bottom surfaces thereof, a first preferred level of resistivity, a preferred first type conductivity, a first preferred type conductivity, and a vertical axis aligned substantially parallel with a first preferred crystal axis of the material of the body;

at least one of the opposed major surfaces having a preferred planar crystal orientation which is one selected from the group consisting of (111), (110) and (100);

at least one region of second and opposite type conductivity having a second predetermined level of resistivity, and opposed end surfaces, disposed in the body and extending between and terminating in the two major opposed sur-

faces of the body, each of the end surfaces is coextensive with a respective one of the major surfaces, the material of the at least one region consisting of recrystallized semiconductor material of the body formed in situ in the body by the migration of a melt of metal-rich semiconductor material through the entire body, from one opposed major surface to the other, by thermal gradient zone melting at a predetermined elevated temperature along a thermal gradient aligned substantially parallel with the first preferred crystal axis and the vertical axis of the body and having the metal distributed substantially uniformly throughout the entire region, the level of concentration of the metal therein being determined by the solid solubility limit of that metal in that semiconductor material of the body at that predetermined elevated temperature of migration, the metal comprising a sufficient quantity of at least one dopant impurity material to im-



part the second type conductivity and second predetermined level of resistivity thereto, each of the at least one regions being a low electrical resistance path for conducting electrical currents between the major opposed surfaces of the body;

each of the at least one region of second type conductivity having a vertical axis which is aligned substantially parallel with the first crystal axis;

a P-N junction formed by the contiguous surfaces of the materials of each region and the body;

at least one electrical device associated with one of the two major surfaces of the body;

at least one electrical device associated with the other of the two major surfaces of the body, and

means for electrically connecting the electrical devices associated with the respective two major opposed surfaces via the at least one region of second type conductivity.

3,982,269

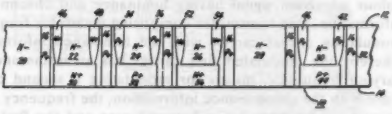
SEMICONDUCTOR DEVICES AND METHOD, INCLUDING TGZM, OF MAKING SAME

Manuel L. Torreno, Jr., Schenectady, N.Y.; Bruno F. Kurz, deceased, late of Schenectady, N.Y. (by Elizabeth Kurz-Beerli, executrix), and Surinder Krishna, Ballston Lake, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 22, 1974, Ser. No. 526,225

Int. Cl.² H01L 29/04, 27/04, 7/00

U.S. Cl. 357—60 **11 Claims**



1. A homogeneous integrated power structure including:

a body of semiconductor material having two major opposed surfaces forming respectively the top and bottom surfaces of the body, a predetermined level of resistivity, a predetermined first type conductivity, a predetermined lifetime, and a vertical axis substantially perpendicular to the major opposed surfaces;

at least one of the major opposed surfaces having a preferred crystal planar orientation;

a plurality of planar regions disposed in the body and extending between, and terminating in, the opposed major surfaces, and being oriented in a direction aligned with a first preferred crystal axis of the crystal structure of the material of the body;

each planar region having two major opposed surfaces oriented substantially perpendicular to the major opposed surfaces of the body and substantially parallel to the vertical axis of the body and a second preferred crystal axis of the material of the body;

the planar regions are oriented with respect to each other so that selected ones thereof at least intersect, and are integral, with, each other so as to divide the body into a plurality of spaced regions of the original material of the body;

the material of each planar region is of a predetermined second and opposite type conductivity and consists of recrystallized semiconductor material of the body;

the recrystallized material of each planar region is formed in situ by the migration of a melt of metal-rich semiconductor material of the body by thermal gradient zone melting at a predetermined elevated temperature along a thermal gradient aligned substantially parallel with the second predetermined crystal axis and the vertical axis of the body, the metal of the melt is substantially uniformly distributed throughout the recrystallized material of the region and has a predetermined uniform level of concentration which is determined by the solid solubility limits of that metal in that semiconductor material at that predetermined elevated temperature of migration;

the metal of the melt consisting of at least one dopant impurity material to impart the type conductivity and resistivity to the recrystallized material of the planar region;

a plurality of P-N junctions electrically isolating the spaced regions from each other;

each P-N junction being formed by the abutting contiguous surfaces of each major surface of a planar region and the material of the body, an end portion of each P-N junction being exposed at the opposed major surfaces of the body;

at least one signal or control semiconductor device having an electrical characteristic of functioning at less than 1 ampere and at less than 500 volts formed in one of the spaced regions;

at least one power semiconductor device having an electrical characteristic of functioning at no less than 1 ampere and at no less than 500 volts, and

electrical circuit means for electrically connecting together all the semiconductor devices formed in the body.

3,982,270

DEEP DIODE VARACTORS

Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 411,149, Oct. 30, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,660

Int. Cl.² H01L 29/04, 29/92, 7/00

U.S. Cl. 357—60 **32 Claims**

1. A semiconductor varactor comprising

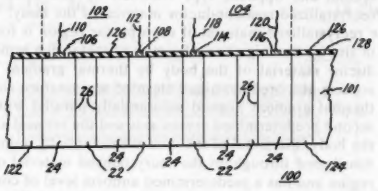
a body of semiconductor material having two opposed major surfaces forming respectively the top and bottom surfaces of the body, a predetermined level of resistivity, a predetermined first type conductivity, a preferred crystal structure and a vertical axis substantially perpendicular to the major opposed surfaces;

at least one of the opposed major surfaces having a predetermined crystal planar orientation which is one selected from the group consisting of (100), (110) and (111);

a plurality of spaced planar regions of recrystallized semiconductor material of the body having a second and opposite type conductivity than that of the body and a predetermined level of resistivity formed in the body and so oriented as to be aligned with a first preferred crystal axis of the material of the body;

each of the spaced planar regions having two opposed major surfaces extending between, and terminating in, the opposed major surfaces extending betweeen, and terminating, in, the opposed major surfaces of the body and oriented substantially perpendicular thereto and substantially parallel with the vertical axis of the body and a second preferred crystal axis of the material of the body;

the recrystallized material is formed in situ by the migration of a melt of metal-rich semiconductor material of the body by thermal gradient zone melting at a predetermined elevated temperature along a thermal gradient substantially parallel with the second preferred crystal axis and the vertical axis of the body and has a predetermined level of concentration of the metal of the melt as



determined by the solid solubility limit of that metal in that semiconductor material at that predetermined elevated temperature of migration and the metal is distributed substantially uniformly throughout the entire region;

the metal consisting of at least one dopant impurity material to impart the type conductivity and level of resistivity to the planar region;

a P-N junction formed by the abutting, contiguous surfaces of the material of each of the planar regions and the material of the body;

each P-N junction being substantially perpendicular to, and exposed at, the major opposed surfaces of the body;

the spaced planar regions and the material of the body between each pair of planar regions defining a lamellar structure of a plurality of integral diodes arranged in a series electrical circuit;

electrical contact means affixed to selected surface areas of the body to enable a predetermined number of P-N junctions to be biased by an applied potential; and

the electrical characteristic of the varactor is a voltage dependent capacitance.

3,982,271

HEAT SPREADER AND LOW PARASITIC TRANSISTOR MOUNTING

Daniel Olivieri, Huntington Station, N.Y., and Robert James Socci, Delran, N.J., assignors to RCA Corporation, New York, N.Y.

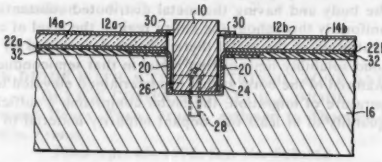
Filed Feb. 7, 1975, Ser. No. 548,010

Int. Cl.[2] H01L *23/02;* **H01P** *3/08*

U.S. Cl. 357—81 **7 Claims**

1. In a transistor mounting apparatus of the type used in high power microstrip circuits including a transistor wherein said transistor is mounted in a slot formed in a circuit carrier block formed of electrically and thermally conductive material serving as a heat sink and electric ground, further including a non-conductive substrate having on one face a strip line conductor and on the other face a conductive ground plane, said ground plane being positioned to be mounted on said circuit carrier block, said substrate, including said strip line conductor and said ground plane arranged to receive said transistor, and further including electrically conductive connections between said transistor and said strip line conductor, the improvement comprising:

a strip of thin, soft, deformably, electrically and thermally conductive material, said strip being positioned in said



slot and clamped against the bottom wall of said slot by said transistor, the respective ends of said strip being joined with an electrical and thermal connection to said ground plane at respective opposite portions thereof adjacent said slot, said ground plane including said strip ends being affixed to said block.

3,982,272

COLOR TELEVISION SYSTEM IN WHICH THE CHROMINANCE SUBCARRIER IS LOCKED TO THE FREQUENCY-MODULATED LUMINANCE SIGNAL

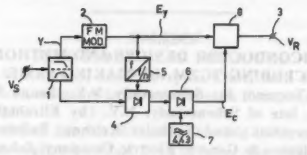
Leonardus Adrianus Johannes Verhoeven; Maarten Rutger de Haan, and Peter Johannes Michiel Janssen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 3, 1974, Ser. No. 466,626

Claims priority, application Netherlands, Feb. 13, 1974, 7401934

Int. Cl.[2] H04N *9/40, 9/39, 5/79*

U.S. Cl. 358—4 **13 Claims**



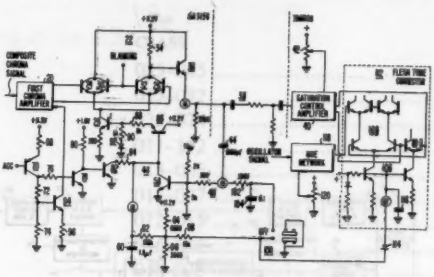
1. A colour television transmitter for the transmission of a colour television signal having luminance and chrominance information, said transmitter comprising means for frequency modulating a first carrier with the luminance information, whereby the modulated first carrier has an instantaneously varying frequency, means for modulating a second carrier wave with the chrominance information, the frequency of the second carrier wave being between zero and the first-order lower side-band of the frequency modulated first carrier corresponding to the highest luminance modulation frequency, and means for locking the frequency of the second carrier to the instantaneous frequency of the modulated first carrier by a constant integral ratio.

3,982,273

SWITCHING ARRANGEMENT FOR FLESH TONE CORRECTION AND CHROMINANCE OVERLOAD CONTROL CIRCUITS

Larry Allen Cochran, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 27, 1975, Ser. No. 580,715
Int. Cl.² H04N 9/535
U.S. Cl. 358—27 5 Claims



1. In a color television receiver including chrominance signal processing apparatus, a system for altering operating characteristics of said signal processing apparatus comprising:

at least one chrominance signal amplifier having a controllable gain characteristic;

signal detection means, coupled to said signal amplifier and responsive to excursions of picture interval chrominance signals having an amplitude exceeding a predetermined level, for providing gain control signals to said signal amplifier;

a source of quiescent direct gain control voltage;

means for coupling said gain control signals and said gain control voltage to said amplifier;

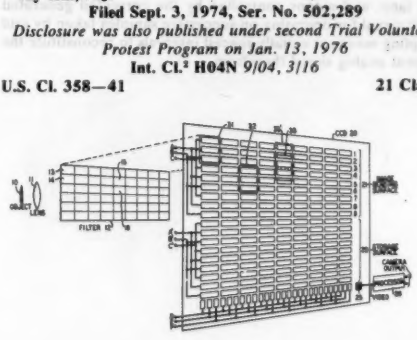
switching means coupled to said detection means and to said source of gain control voltage for simultaneously altering said predetermined level and said quiescent gain control voltage so as to increase permissible peak excursions of said chrominance signals while relatively maintaining the level of other portions of said chrominance signals.

3,982,274

COLOR CODING FILTER FOR CHARGE-COUPLED-DEVICE CAMERA

Sooyoung Chai, Madison Township, Middlesex County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 3, 1974, Ser. No. 502,289
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² H04N 9/04, 3/16
U.S. Cl. 358—41 21 Claims



1. A color coding filter for use with an imaging device for converting light into electrical signals using a multiple-field format, the imaging device having a sensing surface being divided into an array of rectilinear resolution cells distinctive for each field, the cells defining a grid-pattern in each field and the cell boundaries in successive fields being displaced in at least one dimension to form overlapping grid patterns in the successive fields,

the filter comprising a plurality of rectilinear zones which are arranged in direct correspondence to the cell array of the sensing surface so that all light from a scene impinging on any cell of the sensing surface passes through a corresponding zone in the filter,

a plurality of discrete color areas being contained within each filter zone and being arranged so that the zone boundaries may be redefined with the change of cell boundaries during successive fields,

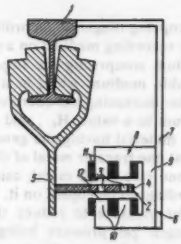
the transmissivity characteristic of each color filter area being selected to produce a desired color coding for each zone.

3,982,275

READ-WRITE APPARATUS FOR USE IN A CONVEYOR CONTROL

Ivan Vasilievich Antonets, ulitsa Kirova, 8, kv. 21; Igor Kasianovich Mlynchik, ulitsa Polbina, 55, kv. 47, and Alexandr Pavlovich Panov, proezd Polbina, 32, kv. 119, all of Ulyanovsk, U.S.S.R.

Filed May 27, 1975, Ser. No. 581,416
Int. Cl.² G11B 5/00
U.S. Cl. 360—1 3 Claims



1. A read-write apparatus for use in a conveyor control device located on the track of the conveyor, the apparatus comprising (1) a carrier having a non-magnetic backing and serving for information recording, storage and playback during its movement along the track; permanent magnets pressed into said backing and spaced at preset distances; (2) a unit for recording the information, including a magnetic core to concentrate magnetic flux in a gap formed between a pair of substantially parallel limb portions of the latter, and having pole pieces spaced in pairs at preset distances, on opposite sides of said carrier, and having opposite poles that are directed towards each other; coils located on said pole pieces for magnetizing said core, to generate an electric signal that builds up the flux in said core; a yoke for said core, common for said pole pieces; (3) a unit located on said track for reading the information, including a magnetic-field pickup for determining the magnitude and direction of the magnetic field built up by said carrier during its movement along the track; input and output electrodes in said pickup; a non-linear excitation circuit in said reading unit for increasing the amplitude of the current pulses on said input electrodes, the input of said excitation circuit being connected with said voltage source, while its output is connected to one of said input electrodes; (4) voltage source means for at least one of said recording and said reading units; (5) a decoder of heteropolar pulses in said reading unit for separating signals of opposite polarities; and (6) an output unit, also in said reading unit, for generating a signal; said decoder being made in the form of a diode bridge which connects said output electrodes with said output unit.

3,982,276

METHOD OF COPYING MAGNETIC RECORDINGS PROVIDED ON A MAGNETIZABLE MEDIUM HAVING A GREATER COERCIVE FORCE BEFORE THAN AFTER RECORDING

Jan Roos, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

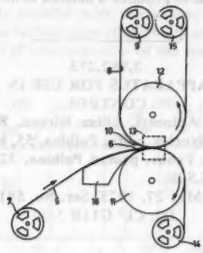
Continuation of Ser. No. 297,716, Oct. 16, 1972. This application Apr. 18, 1974, Ser. No. 461,874

Claims priority, application Netherlands, Oct. 21, 1971, 7114533

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.[2] G11B 5/86

U.S. Cl. 360—17 2 Claims



1. A method of copying magnetic recordings provided onto a first magnetisable recording medium on a second magnetisable recording medium comprising the steps of recording on the first magnetisable medium while in a state of reduced coercivity, thereafter increasing the coercive force of the first magnetisable medium to a value, H_c , said first medium consists of a magnetic material having the general formula M_5R, wherein M is at least one transfer metal of the first long period and R is at least one rare earth metal, said medium, before providing the recordings to be copied on it, being subjected to hydrogen gas under pressure to reduce the coercive force thereof, the hydrogen gas pressure being removed before copying is carried out to increase the coercive force of said first magnetizable medium, contacting the magnetic surfaces of the first magnetisable medium in a state of higher coercivity with the recording thereon and of the second magnetisable medium with each other, subjecting said magnetizable mediums while the surfaces thereof are in contact with one another to a magnetic auxiliary field to form on the second magnetizable medium a duplicate of the recording on the first magnetizable medium, and then separating said magnetizable mediums from each other, the coercive force H_{c_1}, the coercive force H_{c_2} of the second magnetisable medium and the field strength H of the magnetic auxiliary field fulfilling the requirement: $aH_{c_2} < H < (H_{c_1})/a$ with $1 < a < 2$.

3,982,277

TIMING-ERROR COMPENSATION FOR LOW-SPEED TAPE SYSTEMS

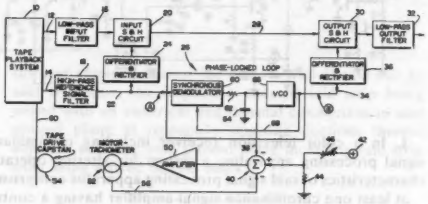
Thomas K. Naylor, Belmont, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 26, 1973, Ser. No. 427,883

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.[2] G11B 27/10

U.S. Cl. 360—27 13 Claims



1. A system for deriving a time-error compensated analog signal from a tape on which an original analog signal was recorded together with a clock signal, said clock signal having a frequency greater than the highest frequency component of interest in said original analog signal and the nominal speed of said tape being below one inch per second, comprising means for moving said tape and deriving therefrom the separate analog and clock signals recorded thereon, control means responsive to the clock signal derived from said tape for controlling the speed of said tape such that slow changes therein are compensated so that the average speed of said tape remains constant and for generating a corrected clock signal whose frequency is constant and equal to the average frequency of the clock signal derived from said tape, sampling means for taking samples of the analog signal derived from said tape in synchronism with the clock signal derived from said tape, and means controlled by the corrected generated clock signal for operating on successive samples taken by said sampling means at equally spaced intervals to reconstitute the original analog signal therefrom.

DESIGN PATENTS

GRANTED SEPTEMBER 21, 1976

ERRATA

For CLASS	See PATENT NO.
025–085	241,534
025–082	241,535
025–074	241,536
011–152	241,567
015–065	241,568
015–027	241,569
012–015	241,571
016–042	241,575
016–032	241,576
016–025	241,577
016–005	241,578

DESIGN PATENTS

GRANTED SEPTEMBER 21, 1976

ERRATA

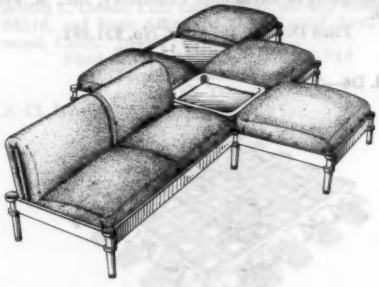
Class
D25-062
D25-063
D25-074
D11-152
D15-063
D15-027
D12-015
D16-013
D16-012
D16-025
D16-005

DESIGNS

SEPTEMBER 21, 1976

241,484
TREAD FOR FOOTWEAR
Jose Paredes Castano, Elche, Alicante, Spain, assignor to Jose Paredes, S.L., Elche, Alicante, Spain
Filed Dec. 18, 1974, Ser. No. 533,892
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

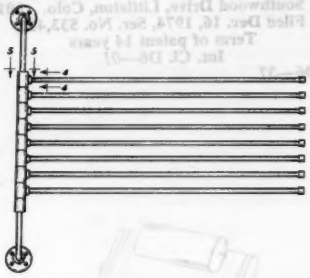
241,485
COMBINED SEAT, TABLE, PLANTER AND MULTIPLE BENCH UNIT OR SIMILAR ARTICLE
Leif Blodee, Holland, Mich., assignor to The Gunlocke Company, Wayland, N.Y.
Filed July 1, 1974, Ser. No. 484,806
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—4



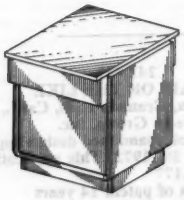
241,486
LOUNGE CHAIR
Raoul Eugene Rodriguez, Denver, Colo. (6160 Southwood Drive, Littleton, Colo. 80121)
Filed Dec. 16, 1974, Ser. No. 533,455
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37

241,487
CHAIR OR THE LIKE
Charles A. Gibilterra, Granada Hills, Calif., assignor to Vecta Group, Inc.
Continuation-in-part of abandoned design application Ser. No. 319,626, Dec. 29, 1972. This application Dec. 30, 1974, Ser. No. 537,177
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

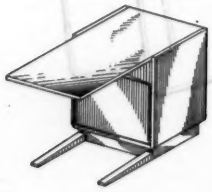
241,488
RACK FOR BLANKETS OR THE LIKE
Joan C. Stenberg, Rte. 1, Box 88, Bristol, Wis. 53104
Filed Aug. 11, 1975, Ser. No. 603,550
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—124



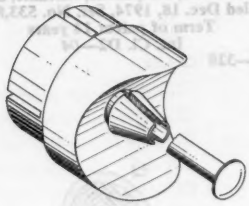
241,489
MODULAR DISPLAY CABINET OR SIMILAR ARTICLE
James H. Karlin, Streamwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 9, 1975, Ser. No. 539,894
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—158



241,490
MODULAR DISPLAY TABLE OR SIMILAR ARTICLE
James H. Karlin, Streamwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 9, 1975, Ser. No. 539,895
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—158

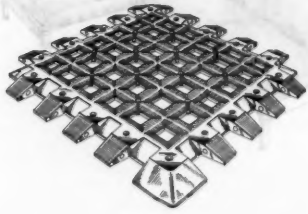


241,491
CHAIR CONNECTOR
Robert W. O'Halloran, 1146 Harrison St., Hollywood, Fla. 33020
Filed Dec. 7, 1972, Ser. No. 312,923
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



241,492
COMBINED SHOPLIFTING-PROOF GARMENT HANGER AND SUPPORT THEREFOR
Nils Ingemar Schwalbe, 9 St. Eriksgatan, 112 39, Stockholm, Sweden
Filed Sept. 23, 1974, Ser. No. 508,467
Claims priority, application Sweden Mar. 25, 1974
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—191

241,493
MODULAR FLOOR MAT
Ralph Ettlinger, Jr., Glencoe, and Glenn L. Beall, Gurnee, Ill., assignors to Economics Laboratory, Inc., St. Paul, Minn.
Filed Dec. 12, 1974, Ser. No. 531,891
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D6—209



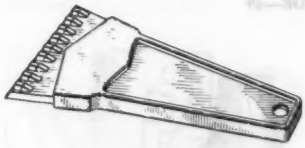
241,494
PLATE OR SIMILAR ARTICLE
Ottorino N. Mercadante, Corning, N.Y., assignor to Corning Glass Works
Filed July 15, 1974, Ser. No. 488,223
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—36

241,495
SALAD DRYER
Jean Mantelet, Paris, France, assignor to Moulinex Societe Anonyme, Bagnolet, France
Filed Nov. 14, 1974, Ser. No. 523,874
Claims priority, application France May 16, 1974
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47

241,496
SALT OR PEPPER SHAKER
Marshall L. Grode, 1132 Laurel Way, Beverly Hills, Calif. 90210, and Rene Alkoff, 1530 N. Laurel Ave., Hollywood, Calif. 90046
Filed July 17, 1975, Ser. No. 596,713
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—56

241,497
TOASTER
Delmas H. Blalock, 128 Lakeside Terrace, Lenoir, N.C. 28645
Filed Nov. 25, 1974, Ser. No. 526,622
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—91

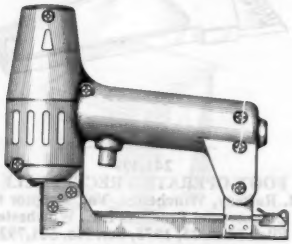
241,498
SCRAPER
Lloyd T. Smith, Newton, Kans., assignor to S/V Tool Company, Inc., Newton, Kans.
Filed Sept. 12, 1975, Ser. No. 612,694
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—184



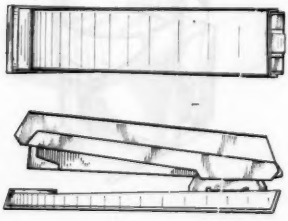
241,499
FOOT-OPERATED RECEPTACLE
William B. Raftery, Winchester, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Mar. 25, 1975, Ser. No. 561,792
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—195

241,500
TORQUE LIMITING DEVICE
Ralph R. Leonard, 1822 S. 266th Place, Kent, Wash. 98031
Filed Aug. 7, 1975, Ser. No. 602,919
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—24

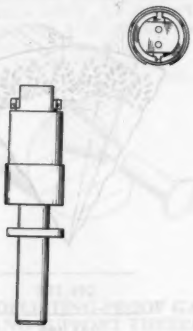
241,501
FASTENER DRIVING TOOL
Richard H. Doyle, Mount Prospect, Salvatore L. Morabito, Northlake, and Andrew I. Yohana, Des Plaines, Ill., assignors to Duo-Fast Corporation
Filed June 5, 1975, Ser. No. 583,958
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—49



241,502
DESK STAPLER
Albrecht Goertz, Nassau, Bahamas, assignor to Acco International Inc., Chicago, Ill.
Filed Nov. 22, 1974, Ser. No. 526,326
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D8—50



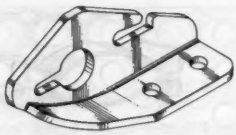
241,503
INJECTOR SLEEVE REMOVING TOOL
Robert E. Parker and Paul E. Parker, both of 2047 Angelcrest Drive, Hacienda Heights, Calif. 91745
Filed May 23, 1975, Ser. No. 580,314
Term of patent 3½ years
Int. Cl. D8—*05*
U.S. Cl. D8—51



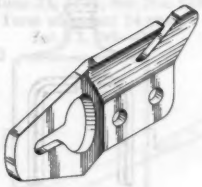
241,504
SHARPENING IMPLEMENT
Kurt Krusche, Frankfurt am Main, and Hubert Zimmermann, Seeheim, Germany, assignors to Allstar Verbrauchsguter GmbH & Co. KG, Frankfurt am Main, Germany
Filed Oct. 30, 1975, Ser. No. 627,382
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—93

241,505
GUARD FOR AN AUTOMOBILE COLUMN LOCK
Billy G. Henry, 1723 W. 60th St., Los Angeles, Calif. 90047
Filed June 19, 1975, Ser. No. 588,615
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—113

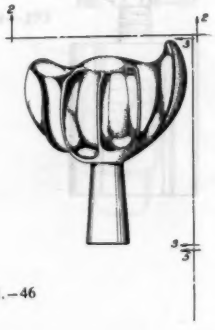
241,506
CHAIN AND HOOK LOCK
Peter J. Condos, 626 Jamestown Road, Burbank, Calif. 91504
Filed Nov. 7, 1975, Ser. No. 629,922
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—137



241,507
CHAIN AND HOOK LOCK
Peter J. Condos, 626 Jamestown Road, Burbank, Calif. 91504
Filed Nov. 7, 1975, Ser. No. 629,923
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—137

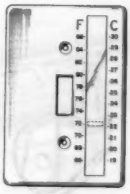


241,508
CONTOURED HANDLE
Donald L. Agate, 4531 Parkway Drive, Hobe Heights, Fla. 33455
Filed Dec. 20, 1974, Ser. No. 535,121
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—147

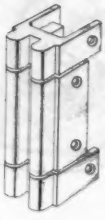


241,509
DOOR KNOCKER OR SIMILAR ARTICLE
Douglas Hinsdale Worrall, Jr., 121 W. Chestnut Hill Ave., Philadelphia, Pa. 19118
Filed Aug. 18, 1975, Ser. No. 605,273
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—177

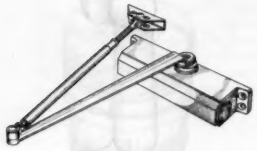
241,510
COMBINED SWITCH PLATE AND THERMOMETER
Donald M. Fisher, R.F.D. 1, Stilesville, Ind. 46180
Filed Apr. 2, 1976, Ser. No. 673,203
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—181



241,511
MODULAR HINGE
M. Vincent Sanderford, 130 Pearson Drive, and Philip J. Davis, Rte. 3, P.O. Box 279, both of Morganton, N.C. 26865
Original design application Sept. 14, 1974, Ser. No. 392,202, now Patent No. 236,797. Divided and this application Jan. 3, 1975, Ser. No. 538,312
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—189

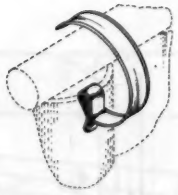


241,512
DOOR CLOSER
Etsuo Hiraishi, Hiroshima, Japan, assignor to Ryobi Ltd., Fuchu-shi, Hiroshima-ken, Japan
Filed Mar. 4, 1975, Ser. No. 555,311
Claims priority, application Japan Sept. 6, 1974
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—203



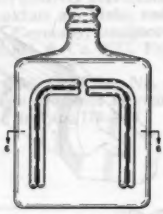
241,513
CASTER
Frank J. Fontana, Stratford, Conn., assignor to Stewart-Warner Corporation, Chicago, Ill.
Filed Jan. 16, 1975, Ser. No. 541,641
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—226

241,514
DECORATOR CLIP
Orville T. Stall, Newport Beach, Calif. (13545 Excelsior, Norwalk, Calif. 90650)
Filed Nov. 10, 1975, Ser. No. 630,691
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—248



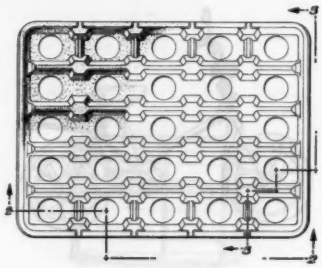
241,515
SPRING FOR BI-FOLD DOORS AND THE LIKE
Kenneth E. Hewson, 626 Colony Drive, Troy, Mich. 48084
Filed July 18, 1973, Ser. No. 380,291
Term of patent 14 years
Int. Cl. D8—*08, 09*
U.S. Cl. D8—259

241,516
PLASTIC CONTAINER FOR LIQUIDS
Robert M. Harris, Jr., Reseda, Calif., assignor to Foremost-McKesson, Inc., San Francisco, Calif.
Filed Apr. 14, 1975, Ser. No. 567,513
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—40

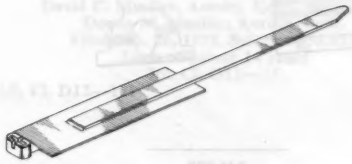


241,517
BOTTLE
Victor Koenigsberg, Franklin Square, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Mar. 25, 1975, Ser. No. 561,812
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—167

241,518
PACKAGING TRAY FOR PORTION CUPS
Gilbert R. Chadbourne, Oakland, Maine, assignor to Keyes Fibre Company
Filed Sept. 16, 1974, Ser. No. 506,276
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—242



241,519
CABLE SECURING STRAP
Lyle H. Mathews, 917 N. College Drive, Santa Maria, Calif. 93454
Filed June 23, 1975, Ser. No. 589,615
Term of patent 14 years
Int. Cl. D9—*06*
U.S. Cl. D9—252

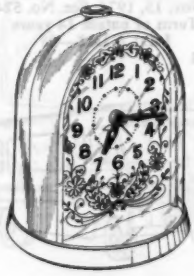


241,520
VEHICLE WHEEL LOCKING NUT
Yoshinobu Fujita and Yasuji Fukuyama, Los Angeles, Calif., assignors to Fujita Industrial Co., Ltd., Santa Monica, Calif.
Filed Sept. 16, 1974, Ser. No. 506,284
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—273

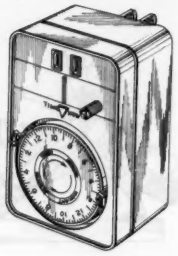
241,521
CLOCK OR SIMILAR ARTICLE
James O. O'Brien, 2101 Hawk Lane, Rolling Meadows, Ill. 60008
Filed Mar. 3, 1975, Ser. No. 554,647
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—8

241,522
TABLE CLOCK
Haruhiko Tateishi, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 14, 1974, Ser. No. 523,875
Claims priority, application Japan Sept. 9, 1974
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

241,523
CLOCK OR SIMILAR ARTICLE
Arthur M. Felske, Westport, Conn., assignor to General Electric Company
Filed May 7, 1975, Ser. No. 575,384
Term of patent 7 years
Int. Cl. D10—*01*
U.S. Cl. D10—23



241,524
TIMER OR SIMILAR ARTICLE
Olle E. Haggstrom, Trumbull, Conn., assignor to General Electric Company
Filed Nov. 13, 1974, Ser. No. 523,234
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40

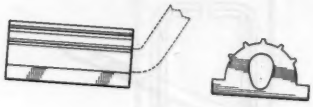


241,525
DIGITAL SCALE
Edward C. Karp, Belvidere, Ill., assignor to Sanitary Scale Company, Belvidere, Ill.
Filed June 2, 1975, Ser. No. 583,057
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91

241,526
BUS
Ronald E. Haugen, Clayton David Partin, Jerry Clarence Brickman, and Joseph Frederick Vinci, Forest City, Iowa, assignors to Winnebago Industries, Inc., Forest City, Iowa
Filed Nov. 15, 1974, Ser. No. 524,128
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—84

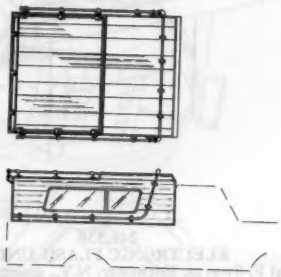
241,527
MOTORCYCLE
Yoshikazu Kojo, Kawagoe, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 15, 1975, Ser. No. 641,084
Claims priority, application Japan June 17, 1975
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110

241,528
KICKSTAND SUPPORT
Joseph J. Massa and James P. Massa, both of 2728 Martin Way, White Bear Lake, Minn. 55110, and Paul W. Werneke, 425 N. Smith Ave., St. St. Paul, Minn. 55102
Filed May 2, 1975, Ser. No. 573,825
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—120

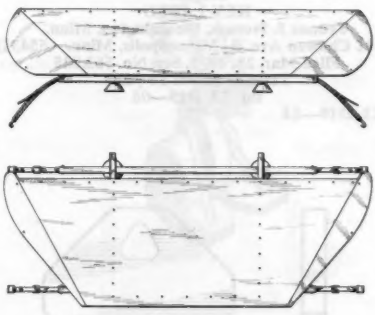


241,529
CHILD'S FLEXION WHEELCHAIR
Thomas R. Blue, 17802 Norwood Park, Tustin, Calif. 92680
Filed Sept. 2, 1975, Ser. No. 609,311
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—131

241,530
COVER FOR A PICKUP TRUCK BED
Frank N. Hayes, N. 3rd St., Womelsdorf, Pa. 19567
Filed Sept. 5, 1974, Ser. No. 503,621
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156

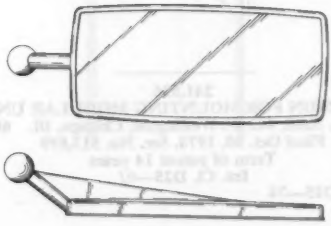


241,531
VEHICLE AIR DEFLECTOR
David C. Mueller, Aurora, Colo., assignor to Donna M. Mueller, Aurora, Calif.
Filed Feb. 26, 1975, Ser. No. 590,612
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181

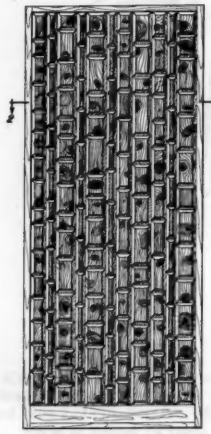


241,532
VEHICLE DOOR MIRROR MOUNTING BRACKET
Joseph R. Bourassa, Huntington, and Manuel Lopez, Trumbull, Conn., assignors to Parker-Hannifin Corporation, Shelton, Conn.
Filed Sept. 13, 1974, Ser. No. 505,737
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—187

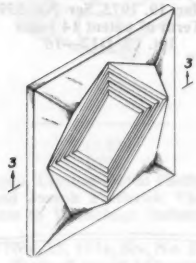
241,533
AUTOMOBILE SIDE VIEW MIRROR
Charles W. Guimond, 1826 Norwood Drive, Grosse Pointe Woods, Mich. 48236
Filed Mar. 19, 1975, Ser. No. 559,904
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—187



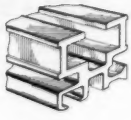
241,534
DECORATION PANEL OR THE LIKE
Robert T. Bogan, P.O. Box 26208, Albuquerque, N. Mex. 87125
Filed Feb. 1, 1974, Ser. No. 438,547
Term of patent 14 years
Int. Cl. D25—*01, 02*
U.S. Cl. D25—85



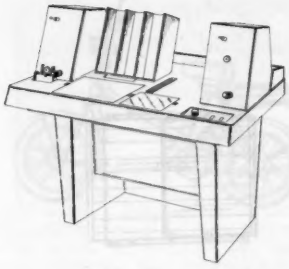
241,535
DECORATIVE PLASTIC PANEL FOR DOORS AND THE LIKE
Warren G. Stichtenoth, 186 Yorkwood Lane, Cincinnati, Ohio 45238
Filed Dec. 16, 1974, Ser. No. 533,412
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—82



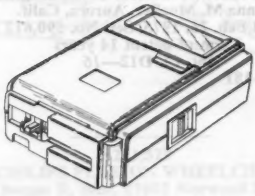
241,536
EXTRUSION FOR MOUNTING MODULAR UNITS
Irving W. Shell, 442 W. Wellington, Chicago, Ill. 60657
Filed Oct. 10, 1974, Ser. No. 513,899
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



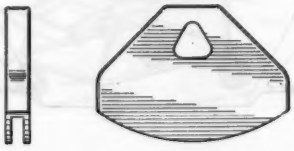
241,537
FILM LOADING CONSOLE OR THE LIKE
Richard J. Olson, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 10, 1975, Ser. No. 567,041
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D16—34



241,538
ELECTRONIC FLASH UNIT
Samuel F. Swayze, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 8, 1975, Ser. No. 566,637
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42



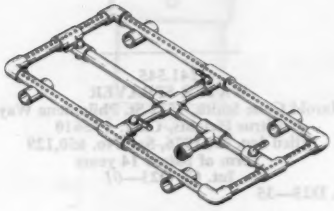
241,539
KEY LABEL
Yvonne J. Iverson, Bloomington, Minn. (8801 Chowen Ave. S., Minneapolis, Minn. 55431)
Filed Mar. 28, 1975, Ser. No. 562,825
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D19—13



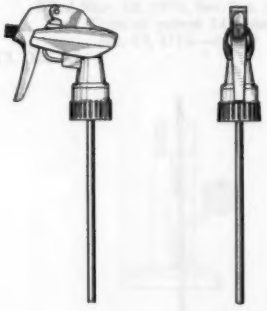
241,540
CONSOLE FOR TEACHING ARITHMETICS
Donald Charles Stephan, Poway, and George William Cone, La Jolla, Calif., assignors to Eric F. Burtis, Redwood City, Calif.
Filed Oct. 25, 1974, Ser. No. 517,987
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62

241,541
PAPER HOLDER
Ellis D. Kohl, 3923 Zenaho St., San Diego, Calif. 92122
Filed Oct. 21, 1974, Ser. No. 516,271
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—86

241,542
DIRECTIONAL SPRINKLER
Elmer O. Thurston, 150 Chenault Road, Lexington, Ky. 40502
Filed Mar. 14, 1975, Ser. No. 558,297
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7



241,543
SPRAYER
Tetsuya Tada, 2–6, 3-chome, Nishinakanobu, Shinagawa-ku, Tokyo, Japan
Filed Nov. 7, 1975, Ser. No. 629,921
Claims priority, application Japan May 8, 1975
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—17

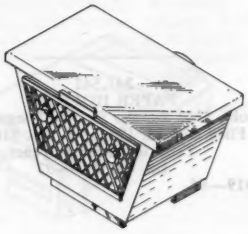


241,544
NOZZLE FOR AN AIR LINE
David Anthony Whitbread, Luton, England, assignor to F. Brauer Limited, Harpenden, England
Filed May 20, 1974, Ser. No. 471,195
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—34

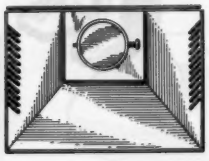
241,545
WATER SPRAYER
Harold Gene Smith, 7512 St. Philomena Way, Citrus Heights, Calif. 95610
Filed Jan. 19, 1976, Ser. No. 650,129
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

241,546
HAND HELD SHOWERHEAD
Leandro P. Rizzuto, Brooklyn, N.Y., assignor to Conair Corporation
Filed Mar. 22, 1976, Ser. No. 669,194
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

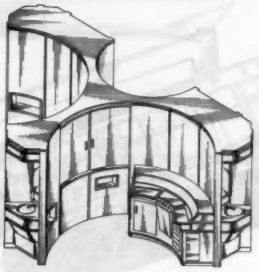
241,547
COMBINED FIREPLACE AND HEATING STOVE
Edwin S. F. Francis, 3930 Hobbs St., Victoria, British Columbia, Canada
Filed Aug. 7, 1975, Ser. No. 602,746
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

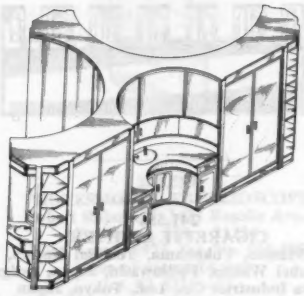


241,548
AIR-CIRCULATING FIREPLACE
Lawrence M. Rheingold, Baldwin, and Alfred P. Rheingold, Freeport, N.Y., assignors to Templet Industries, Inc., Plainview, Long Island, N.Y.
Filed Sept. 23, 1975, Ser. No. 615,995
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



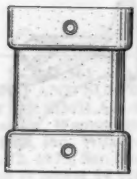
241,549
MODULAR MEDICAL OR DENTAL OPERATORY UNIT
James E. Rota, 2479 Pesquera Drive, Los Angeles, Calif. 90049
Filed Nov. 11, 1974, Ser. No. 522,427
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1 B





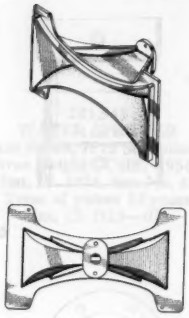
241,550
DENTAL DRILL HANDPIECE
Marius J. Morin, 4610 Sepulveda Blvd., Torrance, Calif. 90505
Filed Oct. 29, 1975, Ser. No. 626,748
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 D

241,551
SINGLE POLE-SINGLE THROW SWITCH STRUCTURE
Ted N. Tilman, 3538 Telegraph Drive, San Jose, Calif. 95132
Filed May 9, 1974, Ser. No. 468,442
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

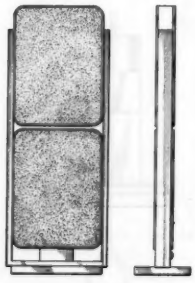


241,552
COMBINED ECCLESIASTICAL MICROPHONE AND SUPPORT THEREFOR
Casimir L. Timm, La Porte, Ind., assignor of a fractional part interest to Lawrence Peska Associates, Inc., New York, N.Y.
Filed Mar. 10, 1975, Ser. No. 556,703
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D26—14 J

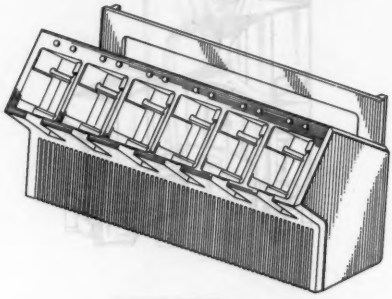
241,553
SPEAKER HORN
Jonas A. Renkus, 2327 Benton Way, Santa Ana, Calif. 92706
Filed July 14, 1975, Ser. No. 595,542
(Filed under Rule 47(b) and 35 U.S.C. 118)
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G

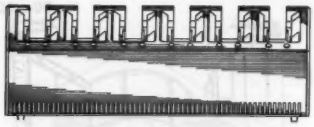


241,554
SPEAKER ENCLOSURE
Jose Juan Bertagni, Newport Beach, and Haskell M. Metz, Laguna Beach, Calif., assignors to Bertagni Electro-acoustic Systems Inc., Costa Mesa, Calif.
Filed Aug. 13, 1975, Ser. No. 604,449
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G



241,555
MULTIPLE BATTERY CHARGER OR SIMILAR ARTICLE
Arnold S. Goldman and Richard J. Toth, Fort Lauderdale, Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 13, 1975, Ser. No. 540,741
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—15 B



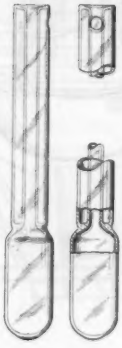


241,556
CIGARETTE LIGHTER
Yoshihiko Matsuo, Yokohama, Yoshimi Kurata, Tokyo, and Shyuhei Wakita, Fujisawashi, Japan, assignors to Kanazawa Industries Co., Ltd., Tokyo, Japan
Filed Apr. 8, 1975, Ser. No. 566,671
Claims priority, application Japan Dec. 12, 1974
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

241,557
ANIMAL WATERING VALVE
Jarl Rune Olde, 4 Laduvagen, 75247 Uppsala, Sweden
Filed May 27, 1975, Ser. No. 581,116
Claims priority, application Sweden Nov. 25, 1974
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

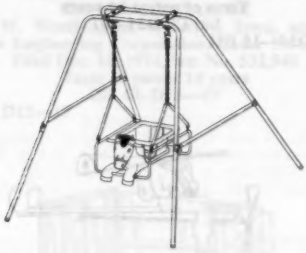
241,558
ANIMAL IDENTIFICATION TAG
Jackson T. Schwindt and Maurice A. Whitney, Cody, Wyo., assignors to Y-Tex Corporation, Cody, Wyo.
Filed Apr. 25, 1975, Ser. No. 571,751
Term of patent 14 years
Int. Cl. D30—*08*
U.S. Cl. D30—43

241,559
PROFESSIONAL EBULLIOSCOPE
Robert Rakowski, 3411 Rosalie Ave., Baltimore, Md. 21234
Filed Apr. 9, 1975, Ser. No. 566,409
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D32—1 R

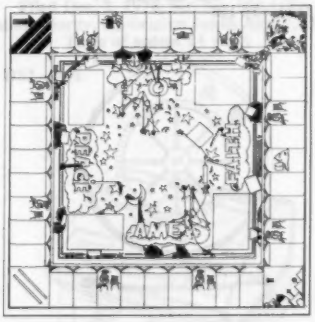


241,560
GAME RACKET YOKE
William E. Portz, North Madison, and Pete Cosmos, Sr., Ashtabula, Ohio, assignors to True Temper Corporation, Cleveland, Ohio
Filed Nov. 4, 1974, Ser. No. 520,240
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST

241,561
CHILD'S SWING AND SUPPORT FRAME ASSEMBLY OR SIMILAR ARTICLES
William R. Tomalinas, Jr., Wapwallopen, Pa., assignor to Roth American, Inc., Wilkes-Barre, Pa.
Filed Mar. 12, 1975, Ser. No. 557,518
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 M

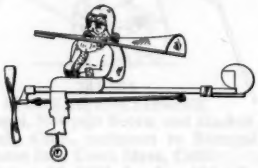


241,562
GAME BOARD
Jack Skoler, 51—15 Van Kleeck St., Elmhurst, N.Y. 11373
Filed Apr. 29, 1975, Ser. No. 572,927
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

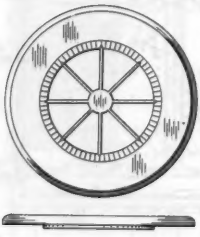


241,563
GOLF CLUB HEAD
Jimmy C. McCord, Rte. 4, Box 20, Roanoke, Ala. 36274
Filed Sept. 5, 1975, Ser. No. 610,551
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

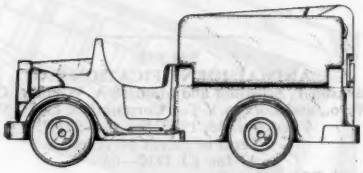
241,564
TOY AIRPLANE
Robert G. Kabchef, 217 Donna Lyn Drive Smyrna, Ga. 30080
Filed Sept. 26, 1974, Ser. No. 509,437
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



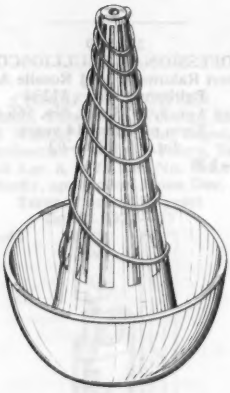
241,565
AERIAL TOY
Lester V. Molenaar, Box 777, W. Highway 40, Willmar, Minn. 56201
Filed Apr. 7, 1975, Ser. No. 565,526
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HS



241,566
TOY TRUCK
George T. Roberts, Mason, and Scott C. Dennison, Cincinnati, Ohio, assignors to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed Apr. 14, 1975, Ser. No. 567,911
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

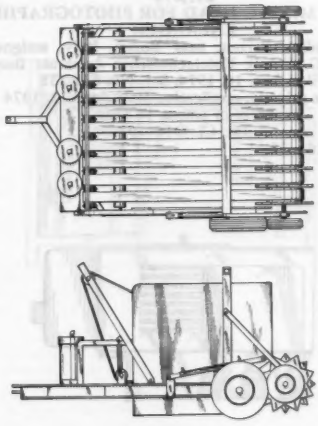


241,567
VINE PLANTER
Will Clarke England, 7310 Eastcrest, Austin, Tex. 78752
Filed Apr. 30, 1975, Ser. No. 572,972
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—152



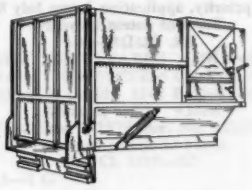
241,568
HANDLE FOR A FLOOR TREATING MACHINE OR THE LIKE
Arthur Herzog, Wallisellen, Zurich, Switzerland, assignor to Diethelm & Co. AG, Zurich, Switzerland
Filed May 31, 1974, Ser. No. 475,031
Claims priority, application Switzerland Dec. 10, 1973
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—65

241,569
MACHINE FOR ROLLING ROUND BALES OF HAY
Joseph B. Kucera, Traer, Iowa, assignor of a fractional part interest to Rudolph L. Lowell, Des Moines, Iowa
Filed Oct. 28, 1975, Ser. No. 626,248
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—27



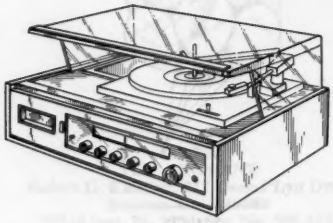
241,570
DECORATIVE LAMP
John H. Holtvoigt, Tipp City, Ohio, assignor to The Dolly Toy Company, Tipp City, Ohio
Continuation-in-part of abandoned design application Ser. No. 173,740, Aug. 20, 1971. This application Feb. 8, 1973, Ser. No. 330,591
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 C

241,571
REFUSE CONTAINER
Stanley W. Worthington, Waterloo, Iowa, assignor to Wayne Engineering Corporation, Cedar Falls, Iowa
Filed Dec. 16, 1974, Ser. No. 532,940
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D12—15

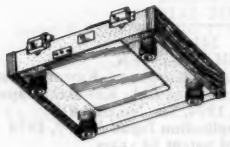


241,572
CASH REGISTER
Takaaki Dobashi and Toshio Kurokawa, Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan
Filed Dec. 2, 1974, Ser. No. 528,617
Claims priority, application Japan Aug. 7, 1974
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D52—4 A

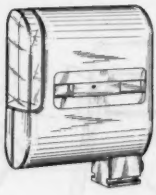
241,573
COMBINED PHONOGRAPH AND TUNER
Melvin H. Boldt, Glenview, and David P. Chuboff, North Barrington, Ill., assignors to Zenith Radio Corporation
Filed May 23, 1974, Ser. No. 472,748
Term of patent 7 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R

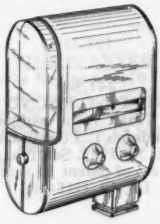


241,574
RECORD PLAYER
Hitoshi Mukai and Takashi Kashidaira, Tokyo, Japan, assignors to Sansui Electric Co., Ltd., Tokyo, Japan
Filed Jan. 3, 1975, Ser. No. 538,481
Claims priority, application Japan July 8, 1974
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R

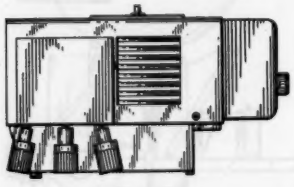


241,575
FLASH UNIT
Hans-Ulrich Schade, Pfuhl, Germany, assignor to Foto-Quelle GmbH, Nurnberg, Germany
Filed Sept. 16, 1974, Ser. No. 506,073
Claims priority, application Germany June 14, 1974
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42

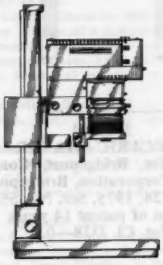




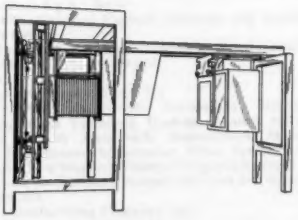
241,576
COLOR MIXING HEAD FOR PHOTOGRAPHIC ENLARGER
Mario Gandini, Brixen, near Bozen, Italy, assignor to Durst AG. Fabrik Fototechnischer Apparate Bozen
Filed Dec. 10, 1974, Ser. No. 531,231
Claims priority, application Italy June 12, 1974
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—32



241,577
PHOTOGRAPHIC ENLARGER
Wilmut Pramstraller, Brixen, Italy, assignor to Durst AG. Fabrik Fototechnischer Apparate Bozen
Filed Mar. 12, 1975, Ser. No. 557,820
Claims priority, application Italy Sept. 13, 1974
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—25

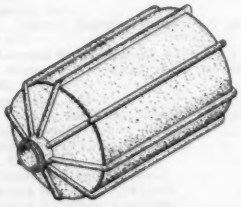


241,578
PHOTOGRAPHIC CAMERA
Joseph H. Wally, Jr., Shawnee Mission, Kans., Robert L. Wall, Raytown, Mo., and Samuel E. Wilson, Mission, Kans., assignors to Filminiature Systems, Inc., Kansas City, Mo.
Filed May 9, 1975, Ser. No. 576,086
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—5

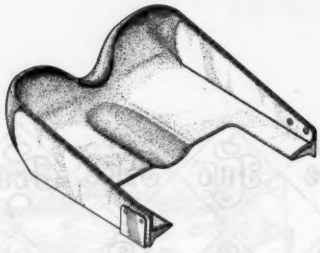


241,579
NUMERICAL LOGOTYPE FONT
Ray J. Harris, 7627 Colehaven, Boise, Idaho 83704
Filed Aug. 8, 1974, Ser. No. 492,389
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B

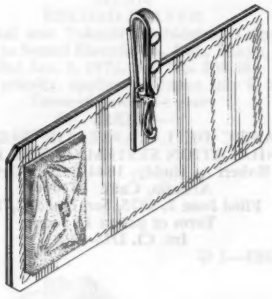
241,580
ELASTIC DEFLATABLE AIR BAG FOR INHALATION SYSTEM OR THE LIKE
Robert A. Huddy, 1044 Balboa Drive, Arcadia, Calif. 91006
Filed June 2, 1975, Ser. No. 582,784
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D83—1 G



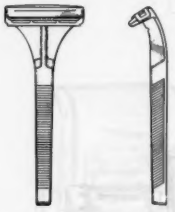
241,581
SHAMPOO TRAY
Frank E. Gonzales, 7842 Santa Monica Ave., Stanton, Calif. 90680
Filed July 26, 1974, Ser. No. 492,052
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



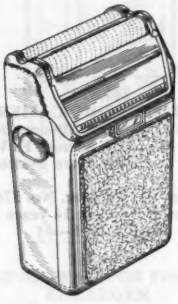
241,582
KEY CASE
Lynn Stark, 21614 85th St. SW., Edmonds, Wash. 98020
Filed Nov. 27, 1974, Ser. No. 527,563
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—8



241,583
DISPOSABLE RAZOR
Tamoru Asano, Gifu, Japan, assignor to Sanwa Cutlery Co., Ltd., Tokyo, Japan
Filed Oct. 25, 1974, Ser. No. 517,930
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A



241,584
ELECTRIC SHAVER
Hermann R. Schaefer, Bridgeport, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.
Filed Feb. 24, 1975, Ser. No. 552,634
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21st DAY OF SEPTEMBER, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Christiaens Societe Anonyme: *See*—
Vanhoof, Pierre M.; and Clarebout, Pierre M., 3,981,872.

A. J. Bingley Limited: *See*—
Lee, Michael John, 3,981,230.

A.P.V. Company Limited, The: *See*—
Considine, William Howard, 3,981,621.

A/S Raaco Storage Systems: *See*—
Damberg, Ejvind, 3,981,251.

AB Ljungmans Verkstader: *See*—
Wall, Karl Bertil, 3,981,633.

Abbott Laboratories: *See*—
Oslapas, Raymond; and Herrin, Thomas Raymond, 3,981,982.
Redmer, Wilbert; Rolin, Kenneth; and Nittel, Herman, 3,981,956.

Abell, William A., Jr.; Field, Thomas R.; Haus, Ralph A.; and Shakib, Iraj D., to International Business Machines Corporation. Non return to home rack shift selection mechanism for a single element printer. 3,981,386, Cl. 197-18.000.

Abolins, Visvaldis; Cooper, Glenn D.; and Lee, Gim F., Jr., to General Electric Company. Blends of a polyphenylene ether resin, alkenyl aromatic resins modified with EPDM rubber and graft polymerized high rubber content polymers. 3,981,841, Cl. 260-42.180.

Abom, Jan Viktor. Solid fuel injection apparatuses. 3,981,277, Cl. 123-23.000.

Abrahams, Louis; Hutchins, Burleigh M., Jr.; and Waters, James L., to Waters Associates, Inc. Pumping apparatus. 3,981,620, Cl. 417-42.000.

Abrams, Max E.; and Wahlenmaier, Jess E., to Spring Machine, Inc. Electrical brake control system. 3,981,542, Cl. 303-20.000.

Abrams, Walter M.: *See*—
Kaplan, Richard B.; Gonnella, Sebastian; and Abrams, Walter M., 3,982,148.

ACF Industries, Incorporated: *See*—
Reedy, Charles E.; and Carlson, Edwin S., 3,981,481.

Adams, Stewart Sanders; Armitage, Bernard John; Nicholson, John Stuart; and Tantum, James Gordon, to Boots Pure Drug Company Limited. 2-(Substituted phenyl) propionic acids. 3,981,905, Cl. 260-473.00R.

Adco-West Machinery Manufacturing Company: *See*—
Landers, Adrian L., 3,981,393.

Addressograph Multigraph Corporation: *See*—
Jesensky, Alexander; Meller, Frederick D.; Patzke, Robert C.; and Willey, Gilbert W., 3,981,574.

Adimari, Louis J.; and Dusoc, George D., to United States of America, Army. Pyramid projectile payload ejection device. 3,981,244, Cl. 102-69.000.

Adler, Meryle D. W.; and Brown, John T., to Corning Glass Works. Temperature sensing device and method. 3,982,218, Cl. 338-22.00R.

Adolf Buddenberg GmbH: *See*—
Buddenberg, Adolf; Hengst, Bruno; and Weskamp, Josef, 3,981,651.

Aerodyne Research Incorporated: *See*—
Camac, Morton, 3,982,208.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Galzy, Pierre; and Moulin, Guy Jean, 3,981,773.

AGFA-Gevaert, A.G.: *See*—
Berthold, Werner; von Konig, Anita; and Timmler, Helmut, 3,981,731.
Weinert, Volker; Hujer, Friedrich; and Knapp, Walter, 3,981,579.

AGIP Nucleare S.p.A.: *See*—
Brambilla, Giovanni; Caporali, Giacomo; and Zambianchi, Mario, 3,981,960.

Agnew, Kenneth Leslie. Iron chloride activated oxidation of sulfide ores. 3,981,963, Cl. 423-39.000.

Aikoh Co., Ltd.: *See*—
Takashima, Masaru, 3,981,721.

Aimbinder, Mark Borisovich; Zhitomirsky, Mikhail Iosifovich; Denisova, Maria Vasilievna; Grabilin, Anatoly Mikhailovich; Lapushkin, Grigory Alexeevich; Kupershmidt, Moisei Zusievich; Mazov, Jury Alexcevich; Terentiev, Viktor Petrovich; Sergeev, Jury Vasilievich; and Muzylev, Vladimir Sergeevich. Single process twisting machine for producing twisted yarn from two strands. 3,981,130, Cl. 57-58.300.

Airborne Manufacturing Company: *See*—
Hokky, Stephen G., 3,982,146.

Aisin Seiki Kabushiki Kaisha: *See*—
Ban, Masashi; Ishikawa, Masakazu; and Uemura, Hiroshi, 3,981,147.

Aizawa, Tatsuo: *See*—
Takahashi, Kenzi; Kouchi, Toshihiro; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,981,730.

Akiyama, Takuya: *See*—
Fujita, Masao; Akiyama, Takuya; Saeki, Yoshito; and Ueno, Yasuhiko, 3,981,889.

Aktiebolaget Platmanufaktur: *See*—
Bjorkstrom, Gosta, 3,981,711.

Akzona Incorporated: *See*—
Meyer, Gerhard; Toth, Anton; and Laudien, Dieter, 3,981,847.

Al-Shaikh, Abdul-Rahman A., to Westvaco Corporation. Apparatus and method for controlling the stock flow to a paper machine headbox. 3,981,767, Cl. 162-198.000.

Alberny, Robert; Leclercq, Alain; and Birat, Jean-Pierre, to Institut de Recherches de la Siderurgie Francaise (IRSID). Method to improve the structure of cast metal during continuous casting thereof. 3,981,345, Cl. 164-49.000.

Alberti, Rosette Caroline. Electric knife with guide blade. 3,981,078, Cl. 30-293.000.

Alburn, Harvey E.; and Grant, Norman H., to American Home Products Corporation. Amides of 1-aminocyclopentane carboxylic acid. 3,981,915, Cl. 260-557.00R.

Alcan Aluminum Corporation: *See*—
Reed, Charles Paul, 3,981,116.

Alex L. Clark Limited: *See*—
Ramsdale, Roy, 3,981,092.

Alexander, Kenneth B.; and Flathau, Robert J., to Symons Corporation. Spreader clip assembly for a concrete wall form. 3,981,476, Cl. 249-42.000.

Alexander, Robert L.: *See*—
Herrmann, John R.; and Alexander, Robert L., 3,981,249.

Alfa-Laval N.V.: *See*—
Olthoff, Klaas, 3,981,315.

Alferov, Jury Fedorovich: *See*—
Medovar, Boris Izrailevich; Saenko, Vladimir Yakovlevich; Schupak, Grigory Bentsionovich; Alferov, Jury Fedorovich; Karpov, Vladimir Fedorovich; Berman, Kirill Adolfovich; Pogoretsky, Vitaly Vasilievich; Ovseichuk, Vitaly Alexandrovich; Zabolotsky, Petr Stepanovich; Boiko, Georgy Alexandrovich; Oleinik, Vladimir Ivanovich; Grodzitsky, Stanislav Vitalievich; Popov, Viktor Andreevich; and Chvertko, Anatoly Ivanovich, 3,981,349.

Algieri, Salvatore; Weiss, Jonas; and Raudenbusch, Werner Theodor, to American Standard, Inc. Method of melamine glazing of polyester substrates. 3,981,954, Cl. 264-240.000.

Allen, Joseph C.; and Saadeh, Fuad T., to Texaco Inc. In-situ combustion method for the recovery of hydrocarbons. 3,981,362, Cl. 166-260.000.

Allied Chemical Corporation: *See*—
Gancy, Alan B.; and Wamser, Christian A., 3,981,965.
Ray, Ranjan; and Musso, Elisabeth, 3,981,722.

Alling, Richard Lassen; and Wolten, Richard John, to Torrington Company, The. Method of making a thrust washer. 3,981,060, Cl. 29-148.40C.

Allis-Chalmers Corporation: *See*—
Crino, Arthur D., 3,982,083.
Grace, Michael H., 3,982,161.
Mydels, John W., 3,981,367.
Schmucker, William A., 3,981,348.

Allis-Chalmers, Rumely, Ltd.: *See*—
Erskine, Douglas W., 3,981,513.

Alsina, D. Luis Gutierrez, to Gutix S.A. Preservation of crustacea. 3,982,030, Cl. 426-269.000.

Alsop, George Michael, to Union Carbide Corporation. Method and apparatus for testing materials for levels of agents inhibitory or toxic to microorganisms. 3,981,777, Cl. 195-103.50R.

Aluzzo, Peter J.; Gibson, Charles G.; and Olson, Albert T., to General Motors Corporation. Combination dome and cargo lamp. 3,982,119, Cl. 240-7.250.

Alza Corporation: *See*—
Higuchi, Takeru; Hussain, Anwar A.; and Shell, John W., 3,981,303.

Ambrosini, Leonard R.; and Isenson, Raymond S., to United States of America, Army. Self-levitating signal cartridge. 3,981,241, Cl. 102-32.000.

Amdahl Corporation: *See*—
Buelow, Fred K.; and Zasio, John J., 3,981,070.

American Can Company: *See*—
Blanchard, Richard Lewis, 3,981,401.
Ramich, Gary Allen, 3,981,434.

American Cyanamid Company: *See*—
Amin, Ashok Babubhai, 3,982,008.
Amin, Ashok Babubhai, 3,982,036.
Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 3,981,868.
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American Electronic Laboratories, Inc.: *See*—
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American Home Products Corporation: *See*—
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American Hospital Supply Corporation: *See—*
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American Optical Corporation: *See—*
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American Safety Equipment Corporation: *See—*
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American Standard, Inc.: *See—*
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AMF Incorporated: *See—*
Perkins, Joseph R., 3,981,590.

Amin, Ashok Babubhai, to American Cyanamid Company. Calcium phosphate and calciumchlorophosphate compositions. 3,982,008, Cl. 426-2.000.

Amin, Ashok Babubhai, to American Cyanamid Company. Calcium phosphate and calciumchlorophosphate compositions. 3,982,036, Cl. 426-471.000.

AMP Incorporated: *See—*
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Ampex Corporation: *See—*
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Amstar Corporation: *See—*
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Anacon, Inc.: *See—*
Belcher, Ronald; Townshend, Alan; and Bogdanski, Stanley L., 3,981,585.

Andersen, Harold Willids; and Harrison, Charles H., to H.W. Andersen Products Inc. Method and apparatus for controlling a volatile substance. 3,981,701, Cl. 62-49.000.

Anderson, George C. Football shoulder pad restricter. 3,981,027, Cl. 2-2.000.

Anderson, Richard W.; and Pettee, James L., to GTE Sylvania Incorporated. Cover. 3,981,340, Cl. 150-52.00R.

Anderson, Robert D., to TCI, Inc. Cushion clamp for spring shanks of earth working tools. 3,981,472, Cl. 248-358.00R.

Andorf, Paul; Franz, Dietmar; Lieb, Alfred; Upper, Gerd; and Guttropf, Walter, to Carl Freudenberg, Firma. Robot finger. 3,981,528, Cl. 294-99.00R.

Andre, Lee R., to Ford Motor Company. Shock absorber for motor vehicle. 3,981,380, Cl. 188-282.000.

Andrews, Laurance R., to United Technologies Corporation. ECM and EDM tooling for producing holes in airfoil trailing edges. 3,981,786, Cl. 204-224.00M.

Andringa, Keimpe, to Raytheon Company. Laser discharge tube assembly. 3,982,204, Cl. 331-94.50D.

Anthon, Erik W., to Optical Coating Laboratory, Inc. Spatial filtering for error detection. 3,981,562, Cl. 350-162.0SF.

Anthony, Russell E. Adjustable shelving. 3,981,250, Cl. 108-106.000.

Anthony, Thomas R.; and Cline, Harvey E., to General Electric Company. Deep diode lead throughs. 3,982,268, Cl. 357-55.000.

Anthony, Thomas R.: *See—*
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Antonets, Ivan Vasilievich; Mlynchik, Igor Kasianovich; and Panov, Alexandr Pavlovich. Read-write apparatus for use in a conveyor control. 3,982,275, Cl. 360-1.000.

Antos, George J., to UOP Inc. Hydrocarbon conversion with an acidic multimetallic catalytic composite. 3,981,795, Cl. 208-139.000.

Antypas, George A., to Varian Associates. Epitaxial indium-gallium-arsenide phosphide layer on lattice-matched indium-phosphide substrate and devices. 3,982,261, Cl. 357-16.000.

Anzai, Shiro: *See—*
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Aoki, Shigeru; Suzuki, Katuya; and Sakai, Tosimitu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Diaphragm vacuum pump. 3,981,636, Cl. 417-566.000.

Aoki, Shingi: *See—*
Taniguchi, Masao; Machi, Sueo; Kawakami, Waichiro; Hashimoto, Shoji; Kawamura, Keita; and Aoki, Shingi, 3,981,815.

Arai, Motonosuke. Expansion joint and method of installing the same. 3,981,601, Cl. 404-68.000.

Arakawashatai Kogyo Kabushiki Kaisha: *See—*
Nagai, Tsuyoshi, 3,981,473.

Araujo, Roger J.; Borrelli, Nicholas F.; Crow, John D.; and Seward, Thomas P., III, to Corning Glass Works. Method of making fluorine out-diffused optical device. 3,981,707, Cl. 65-3.00A.

Arcadia Refining Company: *See—*
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Archer, John L.: *See—*
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Archer, John S., to TRW Inc. Compliant mesh structure for collapsible reflector. 3,982,248, Cl. 343-840.000.

Arden, Sidney, to Consolidated Foods Corporation. Frozen confections made with stabilized cocoa-flavored syrups. 3,982,042, Cl. 426-631.000.

Armbrust, William D.; Shallenberger, Dennis J.; and Hill, Charles E., to Kennametal Inc. Die segment for briquetting roll. 3,981,477, Cl. 249-135.000.

Armco Steel Corporation: *See—*
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Armitage, Bernard John: *See—*
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Armour Pharmaceutical Company: *See—*
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Armstrong, Calvin N.: *See—*
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Arneson, Edwin L., to Federal Paper Board Company, Inc. Article carrier. 3,981,397, Cl. 206-178.000.

Arnold, Carl R.; and Arnold, Charles D., to Raymond Lee Organization, Inc., The, a part interest. Rock gathering machine. 3,981,365, Cl. 171-63.000.

Arnold, Charles D.: *See—*
Arnold, Carl R.; and Arnold, Charles D., 3,981,365.

Arnold, Francis T.: *See—*
Freeman, Lawrence M.; and Arnold, Francis T., 3,981,581.

Arnould, Marcel M. Secret compartment article. 3,981,339, Cl. 150-36.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Fukuoka, Yohei; Kato, Toshio; Imai, Norio; Nishikido, Joji; Hamada, Masato; Mikami, Hiroshi; Iwasaki, Hirohumi; and Koike, Toshihisa, 3,981,906.

Asai, Kenji: *See—*
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Asai, Komei: *See—*
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Ash, Glenn R.: *See—*
Cululi, John J.; and Ash, Glenn R., 3,981,567.

Asher, Brian Roy; and Thompson, Morice William, to Imperial Chemical Industries Limited. Process for the preparation of polymer dispersions. 3,981,839, Cl. 260-33.60R.

Ashida, Akira; and Takahashi, Kiyoshi, to Canon Kabushiki Kaisha. Motion picture projector device as audio-visual aid and audio-visual system using the same. 3,981,570, Cl. 352-12.000.

Ashland Oil, Inc.: *See—*
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Asiala, Carl F.: *See—*
Sinnett, James M.; Edgington, Leslie N.; and Asiala, Carl F., 3,981,465.

Asmus, Richard W. Container closure. 3,981,412, Cl. 220-270.000.

Aspinwall, Robert H., to General Motors Corporation. Turbomachine rotor stage. 3,981,623, Cl. 416-215.000.

Aspro, Incorporated: *See—*
Eddy, William C., 3,981,545.

Athey, Harold: *See—*
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Atkins, Thomas M., to Kelsey-Hayes Company. Skid control system embodying fail safe bypass. 3,981,543, Cl. 303-21.0AF.

Atlantic Richfield Company: *See—*
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Atlas Copco Aktiebolag: *See—*
Schoeps, Knut Christian, 3,981,647.

Atomic Energy of Canada Limited: *See—*
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Atsumi, Sabulo: *See—*
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Attwood, Terence Edwin; and Farrant, Barry William, to Imperial Chemical Industries Limited. Coating compositions comprising a polysulfone and a fluorocarbon polymer. 3,981,945, Cl. 260-900.000.

Atwood, John G.; and Ducret, Lucian C., to Perkin-Elmer Corporation, The. Sponge irrigation system for automatic analysis apparatus. 3,981,041, Cl. 15-302.000.

Aubrey Manufacturing, Incorporated: *See—*
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Automation Products, Inc.: *See—*
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Sutton, George W.; and Douglas-Hamilton, Diarmaid H., 3,982,209.

Avery, Roger P.; and Petti, Pasquale R., to Bunker Ramo Corporation. Triaxial cable termination and connector subassembly. 3,982,060, Cl. 174-75.00C.

Avramidis, Stellios A.; and Partridge, William T., to FMC Corporation. Dual range infinitely variable speed drive. 3,981,205, Cl. 74-230.17A.

Azuma, Kanae; and Ochiai, Minoru, to Kohkoku Chemical Industry Co., Ltd. Equipment for spouting powder or fluid having mechanism for preventing electric shock. 3,982,157, Cl. 317-2.00J.

Azuma, Masao: *See—*
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Azuma, Tomizo, to Tokico Ltd. Power piston of booster. 3,981,227, Cl. 91-376.00R.

Babunovic, Momir; and Kay, John C., to Barry-Wehmiller Company. Tandem bottle carrier assembly. 3,981,389, Cl. 198-655.000.

Bachman, Albert J., to De Laval Turbine Inc. Liquid-level indicating means. 3,982,087, Cl. 200-84.00C.

Bachofen, Bruno; and Riedl, Karl, to Siemens-Albis Aktiengesellschaft. Recirculatory apparatus for spraying mould parting agents and other substances. 3,981,447, Cl. 239-124.000.

Badger, Joe G.; and Valdettaro, Alarico A., to Sarkes Tarzian, Inc. AFC defeat mechanism. 3,982,187, Cl. 325-457.000.

Bagley, Edward B.: *See—*
Weaver, Mary Ollidene; Bagley, Edward B.; Fanta, George F.; and Doane, William M., 3,981,100.

Bahoshy, Bernard J.; Klose, Robert E.; and Nordstrom, Harold A., to General Foods Corporation. Chewing gums of longer lasting sweetness and flavor. 3,982,023, Cl. 426-3.000.

Bain, Brian M.: *See—*
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Baker Perkins Holdings Limited: *See—*
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Baker, Richmond J.; and Bellen, Johan C., to Council of the Institute of Medical and Veterinary Science, The; and University of Adelaide (Anti-Cancer Foundation), The. Radiopharmaceuticals for cholescintigraphy. 3,981,980, Cl. 424-1.000.

Balducci, Walter O., to Emhart Industries, Inc. Exit lock having cassette mechanism. 3,981,164, Cl. 70-92.000.

Baltzer, Gary L.; Desler, Duane A.; and Pappas, George, to Western Electric Company, Inc. System for measuring the duration of a telephone call. 3,982,073, Cl. 179-7.10R.

Balz, Gunther W., to Roto-Finish Company. Finishing apparatus. 3,981,693, Cl. 51-163.200.

Balzano, Oberdan; and Dondoli, Lando, to Billi S.p.A. Needle selecting means. 3,981,160, Cl. 66-50.00R.

Ban, Masashi; Ishikawa, Masakazu; and Uemura, Hiroshi, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Master cylinder assembly. 3,981,147, Cl. 60-585.000.

Bankoski, Vincent W., Jr., to Du Pont de Nemours, E. I., and Company. Programmable controller. 3,982,228, Cl. 340-172.500.

Banks, William B., to Automation Products, Inc. Method and apparatus for measuring a physical property of a fluid material that varies nonlinearly relative to the density of the fluid. 3,981,183, Cl. 73-61.10R.

Banner, Philip M. Tide and time calculating device. 3,982,104, Cl. 235-88.00N.

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Barnaby, Bernard Sydney, to General Electric Company Limited, The. Combined television/data transmission system. 3,982,064, Cl. 178-5.600.

Barnaby, Bernard Sydney; and Scott, Donald Gordon, to General Electric Company Limited, The. Combined television/data receivers. 3,982,065, Cl. 178-5.80R.

Barradas, George, to Venus Electric Limited. Hair dryer. 3,981,314, Cl. 132-9.000.

Barrington, Burchus Q.; Farley, David L.; and Morrisett, O. L., to Halliburton Company. Method and apparatus for testing wells. 3,981,188, Cl. 73-155.000.

Barry-Wehmiller Company: *See—*
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Barth, Gerald Dean; and Wagner, David Prugh, to Illinois Tool Works Inc. Apparatus for assembling a screw and compressible washer. 3,981,170, Cl. 72-88.000.

Bartolomei, Leroy A., to Optical Coating Laboratory, Inc. Striped dichroic filter with butted stripes and dual lift-off method for making the same. 3,981,568, Cl. 350-317.000.

Bartsch, Wolfgang: *See—*
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BASF Aktiengesellschaft: *See—*
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Bathellier, Andre; and Germain, Michel, to Commissariat a l'Energie Atomique. Method of selective stripping of plutonium from organic solvents loaded with plutonium. 3,981,961, Cl. 423-9.000.

Battiston, Giancarlo; Petrini, Guido; De Alberti, Giordano; and Covini, Romano, to Montedison S.p.A. Process for the preparation of unsaturated carboxylic acids by the catalytic oxidation in gaseous phase of the corresponding aldehydes. 3,981,912, Cl. 260-530.00N.

Baucom, Everett Ira, to Du Pont de Nemours, E. I., and Company. Zinc recovery from acidic aqueous streams. 3,981,966, Cl. 423-104.000.

Bauder, Carl J., to Cambridge Filter Corporation. Fluid pressure sensing apparatus. 3,981,192, Cl. 73-212.000.

Bauer, John R.; and Forney, Joseph M., to Goodyear Tire & Rubber Company, The. Safety support for pneumatic tires. 3,981,341, Cl. 152-158.000.

Baumann, Ernst. Shock absorber and guide rail assembly including the same. 3,981,486, Cl. 256-13.100.

Baxmann, Fritz: *See—*
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Bayer Aktiengesellschaft: *See—*
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BBC Brown Boveri & Company Limited: *See—*
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Beaufait, Daniel L.: *See—*
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Beauvoir, Max G. Process for obtaining sapogenin particularly hecogenin from plant material such as agave sisalana leaves. 3,981,867, Cl. 260-239.55A.

Beck, Norman L.: *See—*
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Bedell, Terrence A.: *See—*
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Belcher, Ronald; Townshend, Alan; and Bogdanski, Stanley L., to Anacon, Inc. Molecular cavity analysis-filter cavity. 3,981,585, Cl. 356-87.000.

Bell & Howell Company: *See—*
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Bellingham, Francis, to Imperial Chemical Industries Limited. Preservatives for forage, hay, grain and animal feeds. 3,982,028, Cl. 426-69.000.

Beloit Corporation: *See—*
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Berezhnoi, Igor Alexandrovich; Elatontsev, Albert Ivanovich; Ignatiev, Vladimir Vasilievich; Ivlev, Djuis Danilovich; Mayanov, Boris Veniaminovich; Svinukhov, Vasily Andriyanovich; Kuzmin, Vladimir Petrovich; Evdokimov, Igor Alexandrovich; and Zhidkov, Boris Alexeevich, deceased (by Zhidkova, Ljudmila Vasilievna, administratrix). Air-cushion landing gear for aircraft. 3,981,462, Cl. 244-100.00A.

Berg, Edward T. Reglet structure. 3,981,108, Cl. 52-61.000.

Berge, Arthur. Apparatus for displaying changeable arrangements of indicia. 3,981,090, Cl. 40-64.00R.

Berges, Dietrich: *See—*
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Bergman, John George, Jr.; Crane, Glen Robert; and Guggenheim, Howard Joseph, to Bell Telephone Laboratories, Incorporated. Ternary ferroelectric fluoride nonlinear devices. 3,982,136, Cl. 307-88.300.

Bergstein, Frank D.; and Nerenberg, Robert W., to Bergstein Packaging Trust. Carton with tightly sealed end closures. 3,981,432, Cl. 229-37.00R.

Bergstein Packaging Trust: *See—*
Bergstein, Frank D.; and Nerenberg, Robert W., 3,981,432.

Berkowitz, Sidney: *See—*
Lobunez, Walter; and Berkowitz, Sidney, 3,981,939.

Berlyn, Robin Wilfrid; and Hutchinson, James David, to Pulp and Paper Research Institute of Canada. Method for segregating bark and foliage from wood chips and twigs. 3,981,453, Cl. 241-21.000.

Berman, Kirill Adolfovich: *See—*
Medovar, Boris Izrailevich; Saenko, Vladimir Yakovlevich; Schupak, Grigory Bentsionovich; Alferov, Jury Fedorovich; Karpov, Vladimir Fedorovich; Berman, Kirill Adolfovich; Pogoretsky, Vitaly Vasilievich; Ovseichuk, Vitaly Alexandrovich; Zabolotsky, Petr Stepanovich; Boiko, Georgy Alexandrovich; Oleinik, Vladimir Ivanovich; Grodzitsky, Stanislav Vitalievich; Popov, Viktor Andreevich; and Chvertko, Anatoly Ivanovich, 3,981,349.

Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, to American Cyanamid Company. Derivatives of 9-oxo-13-trans-prostenoic acid amides. 3,981,868, Cl. 260-240.00J.

Bernstein, William A.; and Doggett, Robert H., to International Business Machines Corporation. Prefixing in a multiprocessing system. 3,982,231, Cl. 340-172.500.

Berry, Clyde Raymond; and Cinzori, Robert J., to Hughes Aircraft Company. AC-DC voltage regulator. 3,982,173. Cl. 323-17.000.

Berthagen, Nils Ture Lennart. Insulating unit. 3,981,111, Cl. 52-171.000.

Berthold, Werner; von Konig, Anita; and Timmler, Helmut, to AGFA-Gevaert, A.G. Stabilization of developed photographic images. 3,981,731, Cl. 96-50.00R.

Bertsch, Arville E.: *See—*
Stant, Ivan H.; and Bertsch, Arville E., 3,981,207.

Bessire, Jean-Jacques; and Loardon, Francis, to Eresa S.A. Mirror follow-up device for a film projector. 3,981,572, Cl. 352-112.000.

Bethlehem Steel Corporation: *See—*
Kranenberg, Helmut; and Hostetter, Richard S., Jr., 3,981,752.

Betlejewski, Frank W., to Bell & Howell Company. Electronic flash unit for cameras. 3,982,117, Cl. 240-1.300.

Bewersdorf, Elmer D.: *See—*
McCain, William B.; Cosgrove, James F.; and Bewersdorf, Elmer D., 3,981,212.

Bezaudun, Jean; and Weisang, Joseph Edouard, to Compagnie Francaise de Raffinage. Electrode for fuel cell. 3,981,746, Cl. 429-13.000.

Bianchi, Massimo: *See—*
Conti, Paolo; and Bianchi, Massimo, 3,981,161.

Bielfeldt, Friedrich Bernd; and Handler, Klaus, to Krauss-Maffei Aktiengesellschaft. Injection-molding machine, especially for thermosetting or thermally cross linkable synthetic resins. 3,981,662, Cl. 425-247.000.

Bijttebier, Gaspar A. H. Process and apparatus for separating supple sheets from a stack. 3,981,495, Cl. 271-18.300.

Billi S.p.A.: *See—*
Balzano, Oberdan; and Dondoli, Lando, 3,981,160.
Conti, Paolo; and Bianchi, Massimo, 3,981,161.

Bilodeau, Richard D., to Monsanto Company. Takeout apparatus for a blow molding machine. 3,981,667, Cl. 425-387.00B.

Bingham, Henry; Glassford, John Gilmour; and Pope, Noel Cuthbert, to Hard Metals Limited. Disc cutting unit for use on rock boring machines. 3,981,370, Cl. 175-373.000.

Bio-Medical Sciences, Inc.: *See—*
Larsson, Raymond P.; and Witonsky, Robert J., 3,981,683.

Birat, Jean-Pierre: *See—*
Alberny, Robert; Leclercq, Alain; and Birat, Jean-Pierre, 3,981,345.

Bisgaard-Jespersen, Peter: *See—*
Valeur, Claus Michael; Bisgaard-Jespersen, Peter; and Schroder, Henning Bernstorff, 3,982,027.

Bittner, John R.; and Wesner, Ronald D., to General Electric Company. Right hand margin control system. 3,981,383, Cl. 197-63.000.

Bittner, Oszkar; and Fisher, Chester Donald, to Sprout, Waldron & Company, Inc. Main shaft support for pellet mills. 3,981,664, Cl. 425-331.000.

Bjorkstrom, Gosta, to Aktiebolaget Platmanufaktur. Lubricating swabbing means for glass container machine. 3,981,711, Cl. 65-165.000.

Black, Dennis A.; and Brucken, Byron L., to General Motors Corporation. Automotive air conditioning system with variable speed traction drive transmission. 3,981,157, Cl. 62-243.000.

Blake, Lawrence Webster: *See—*
Lieber, Clement Eugene; and Blake, Lawrence Webster, 3,981,197.

Blake, Theodore M. Dispensing paint trimmer. 3,981,595, Cl. 401-48.000.

Blanchard, Richard Lewis, to American Can Company. Cover for plates and stacking devices therefor. 3,981,401, Cl. 206-508.000.

Blanton, Elmer Ladelle: *See—*
Tucker, Gerald L.; and Blanton, Elmer Ladelle, 3,981,713.

Bleek, Walter. Body plate serving to secure drain pipes in embankments. 3,981,153, Cl. 61-16.000.

Blise, Bernard G.; and Jessen, Norman H., to Lehman, William O., a part interest. Flow meter system. 3,981,194, Cl. 73-229.000.

Block, Jacob; and Marans, Nelson Samuel, to W. R. Grace & Co. Inhibition of scale on saline water heat exchange surfaces with iminodiacetic acid compounds. 3,981,779, Cl. 203-7.000.

Bloom, William, to Emjay Industries, Inc. Book holder. 3,981,522, Cl. 281-34.000.

Blore, Terence John: *See—*
Steels, Gordon; and Blore, Terence John, 3,981,656.

Blum, Josef; Lamm, Heinz; and Sprang, Alfred, to Daimler-Benz Aktiengesellschaft; and Fried. Krupp Gesellschaft mit beschrankter Haftung. Sealing strip particularly for rotary engines. 3,981,644, Cl. 418-122.000.

Bodle, Ronald L.: *See—*
Moore, Leonard W.; Bodle, Ronald L.; and Fiederer, Conrad, 3,981,199.

Boehringer Ingelheim GmbH: *See—*
Losel, Walter; Traunecker, Werner; and Hoefke, Wolfgang, 3,981,992.
Merz, Herbert; Langbein, Adolf; Walther, Gerhard; and Stockhaus, Klaus, 3,981,874.
Merz, Herbert; Langbein, Adolf; Walther, Gerhard; and Stockhaus, Klaus, 3,982,005.

Boehringer Mannheim G.m.b.H.: *See—*
Fauland, Erich; Kampe, Wolfgang; Thiel, Max; Bartsch, Wolfgang; and Schaumann, Wolfgang, 3,982,012.
Voigtlander, Wolfgang; Kaiser, Fritz; Schaumann, Wolfgang; and Stach, Kurt, 3,981,862.

Boeing Company, The: *See—*
Deminet, Czeslaw; and Gillette, Roger B., 3,981,294.
Funston, Nelson Edward, 3,981,152.
Shah, Anil D., 3,981,466.

Bogdanski, John J., to Pitney-Bowes, Inc. Endless belt envelope flap moistening system. 3,981,270, Cl. 118-257.000.

Bogdanski, Stanley L.: *See—*
Belcher, Ronald; Townshend, Alan; and Bogdanski, Stanley L., 3,981,585.

Bohacz, Maxine: *See—*
Newton, John E.; Bohacz, Maxine; and Lyon, Jerry H., 3,982,192.

Bohmholdt, Gerd; Husemann, Hinrich; and Riedel, Helmut, to Veba-Chemie AG. Process for producing ketones. 3,981,921, Cl. 260-586.00R.

Boiko, Georgy Alexandrovich: *See—*
Medovar, Boris Izrailevich; Saenko, Vladimir Yakovlevich; Schupak, Grigory Bentsionovich; Alferov, Jury Fedorovich; Karpov, Vladimir Fedorovich; Berman, Kirill Adolfovich; Pogoretsky, Vitaly Vasilievich; Ovseichuk, Vitaly Alexandrovich; Zabolotsky, Petr Stepanovich; Boiko, Georgy Alexandrovich; Oleinik, Vladimir Ivanovich; Grodzitsky, Stanislav Vitalievich; Popov, Viktor Andreevich; and Chvertko, Anatoly Ivanovich, 3,981,349.

Boise Cascade Corporation: *See—*
Thornhill, Dewey B.; and Frank, Ralph E., Jr., 3,981,433.

Bokenkamp, Donald G., to Dolphin International, Inc. Riser pipe stacking system. 3,981,369, Cl. 175-5.000.

Bolea Camprubi, Anselmo, to Incotex, S.A. Crossing warp mechanism. 3,981,331, Cl. 139-54.000.

Boller, Arthur; and Scherrer, Hanspeter, to Hoffmann-La Roche Inc. Mixtures of liquid crystals. 3,981,817, Cl. 252-299.000.

Bolliger, Edwin, to J. Bobst & Fils S.A. Safety clutch device. 3,981,382, Cl. 192-150.000.

Bolster, Robert N., to United States of America, Navy. Grease composition. 3,981,810, Cl. 252-32.70E.

Bom, Cornelis Johannes Gerardus: *See—*
van der Lely, Cornelis; van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 3,981,366.

Bomar, Bruce W.: *See—*
Kalb, Henry T.; Cline, Virgil A., Jr.; and Bomar, Bruce W., 3,982,101.

Bontrager, Lloyd J. Lift mechanism for a camper top. 3,981,529, Cl. 296-23.00C.

Bookless, George William, to Bell & Howell Company. Microfilm copyboard with document index. 3,981,582, Cl. 355-75.000.

Boom, Willem: *See—*
Sijtstra, Sebastianus; and Boom, Willem, 3,982,166.

Boots Pure Drug Company Limited: *See—*
Adams, Stewart Sanders; Armitage, Bernard John; Nicholson, John Stuart; and Tantum, James Gordon, 3,981,905.

Booz, David L.; Brown, Ford J.; and Merwarth, Richard J., to Western Electric Company, Inc. Apparatus for conveying articles to form layers of fusible metal thereon. 3,981,392, Cl. 198-377.000.

Bore, Pierre: *See—*
Ghilardi, Giuliana; Bore, Pierre; and Grollier, Jean-Francois, 3,981,676.
Ghilardi, Giuliana; Bore, Pierre; and Grollier, Jean-Francois, 3,981,678.

Borg-Warner Corporation: *See—*
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Gritter, David James; and Studtmann, George Henry, 3,982,170.
Ivey, John Saxon; and Braybrook, Kenneth Albert, 3,981,068.
Nosek, Thaddeus W., 3,981,381.
Zimmer, George A.; and Struttmann, Hilarius S., 3,981,550.

Borrelli, Nicholas F.: *See—*
Araujo, Roger J.; Borrelli, Nicholas F.; Crow, John D.; and Seward, Thomas P., III, 3,981,707.

Borysko, Emil, to Ethicon, Inc. Thermal attachment of surgical sutures to needles. 3,981,307, Cl. 128-339.000.

Bose, Bimal K.; and Espelage, Paul M., to General Electric Company. Phase shifter for controlling the power components and power factor of a cycloconverter. 3,982,168, Cl. 321-69.00R.

Boshoff, Pieter Nico Sinclair, to Pienaar, Hendrik Lukas. Aid in the management of clinical emergencies in medical and dental practices and other circumstances. 3,981,398, Cl. 206-223.000.

Bossert, Friedrich: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,981,882.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,981,893.

Bottoms, Harry Simister, to Lucas Aerospace Limited. Gear pumps and motors. 3,981,646, Cl. 418-190.000.

Bourns, Inc.: *See—*
Smith, Ronald Eugene, 3,982,221.

Bowman, Donald E., to Catalyst Research Corporation. Time delay fuse. 3,981,222, Cl. 86-1.00R.

Boyd, David M.: *See—*
Kellar, James S.; Carson, Don B.; and Boyd, David M., 3,981,797.

Boyle, Robert M. Soft contact lens inspection device. 3,981,593, Cl. 356-239.000.

BP Chemicals International Limited: *See—*
Walton, John Reginald; and Yeomans, Bertram, 3,981,918.

Braden, Denver, to Illinois Tool Works Inc. Soldering method. 3,982,047, Cl. 427-123.000.

Bradford, Christopher William; and Middleton, Harry, to Johnson Matthey & Co., Limited. Electroplating of gold and gold compounds therefor. 3,981,782, Cl. 204-46.00G.

Bradshaw, George B., to United States of America, Air Force. High temperature radioisotope capsule. 3,981,805, Cl. 250-493.000.

Brady Air Controls, Inc.: *See—*
Holt, Corbly LeRoy, 3,981,319.

Brady, Arthur M.: *See—*
DeVito, George, 3,981,343.

Brahos, William: *See—*
Kratcoski, Francis L.; and Brahos, William, 3,982,094.

Braithwaite, David G.; and Seale, Virgil L., to Nalco Chemical Company. Process for producing a pure high surface area alumina. 3,981,979, Cl. 423-628.000.

Braithwaite, David G.: *See—*
Ries, Donald G.; and Braithwaite, David G., 3,981,798.

Brambilla, Giovanni; Caporali, Giacomo; and Zambianchi, Mario, to AGIP Nucleare S.p.A. Reprocessing method of caramic nuclear fuels in low-melting nitrate molten salts. 3,981,960, Cl. 423-5.000.

Brandenstein, Manfred: *See—*
Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 3,981,610.

Brandon, Clarence W., to Brandon, Orpha B., a part interest. Sonic or energy wave generator and modulator. 3,981,624, Cl. 417-53.000.

Brandon, Orpha B.: *See—*
Brandon, Clarence W., 3,981,624.

Branson Ultrasonics Corporation: *See—*
Summo, Arthur M., 3,981,759.

Braybrook, Kenneth Albert: *See—*
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Breisch, John H.; and Brown, William L., 4th, to Midland-Ross Corporation. Gas powered motor. 3,981,229, Cl. 92-72.000.

Breu, Dennis Ludwig, to Sperry Rand Corporation. Variable turn coil winder. 3,981,333, Cl. 140-1.000.

Briairc, Henricus Cornelis Johannes, to IWS Nominee Company Limited. Method and device for the felting of sliver and suchlike into felted yarns. 3,981,129, Cl. 57-35.000.

Bridgestone Fire Company Limited: *See—*
Fujio, Ryota; Kataoka, Nobuyuki; Fukabori, Yoshihide; and Anzai, Shiro, 3,981,943.

Briggs, George Oliver, to International Basic Economy Corporation. Screw type apparatus for drying moist polymeric materials. 3,981,658, Cl. 425-205.000.

Briggs & Stratton Corporation: *See—*
Harkness, Joseph R., 3,981,289.

Briggs, William R.; and Ripperger, Eugene A., to United States of America, Army. Paper honeycomb cushioning pad. 3,982,057, Cl. 428-73.000.

Bristol, James A.: *See—*
Yale, Harry L.; and Bristol, James A., 3,981,886.

British Chrome & Chemicals Limited: *See—*
Swales, Danvers A., 3,981,964.

British Industrial Plastics Limited: *See—*
Ogden, Dennis H., 3,981,602.

Broaster Co., The: *See—*
Luebke, Clem J.; Beck, Norman L.; and Daniels, Lowell W., 3,981,044.

Brock, Gregory C., Jr.: *See—*
Gambill, Ulysses T.; and Brock, Gregory C., Jr., 3,981,669.

Brocklehurst, Charles E., to Riegel Textile Corporation. Apparatus for the manufacture of disposable diapers or other articles having stop motion devices therein. 3,981,763, Cl. 156-352.000.

Brodsky, Harvey A.: *See—*
Weiss, Edward A.; and Brodsky, Harvey A., 3,982,071.

Brody, Frederick, deceased: *See—*
Halasz, Alexander; Brody, Frederick, deceased; and Newman, Richard, executor, 3,981,677.

Broemer, Heinz; Kaes, Hans-Herbert; and Pfeil, Emanuel, to Ernst Leitz G.m.b.H. Biocompatible glass ceramic material. 3,981,736, Cl. 106-39.600.

Brookes, Ronald R. Method of laminating graphite sheets to a metal substrate. 3,981,427, Cl. 228-122.000.

Brooks, Susie C., to Raymond Lee Organization, Inc., The, a part interest. Neck pillow device. 3,981,032, Cl. 5-338.000.

Brooks, William O.; and Hill, Clifford B., to United States of America, Navy. Square wave to sine wave converter. 3,982,189, Cl. 328-27.000.

Brown, Alvin E.; and Thun, Niels, to Danfoss A/S. Method and apparatus for the ultrasonic measurement of the flow velocity of fluent media. 3,981,191, Cl. 73-194.00A.

Brown, Earl Franklin; Eilenberger, Robert Lewis; Gordon, Alan Mayer; Gordon, Pat Le Mar; and Limb, John Ormond, to Bell Telephone Laboratories, Incorporated. Methods and apparatus for reducing the bandwidth of a video signal. 3,982,063, Cl. 178-6.000.

Brown, Ford J.: *See—*
Booz, David L.; Brown, Ford J.; and Merwarth, Richard J., 3,981,392.

Brown, John T.: *See—*
Adler, Meryle D. W.; and Brown, John T., 3,982,218.

Brown, William L., 4th: *See—*
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Brucken, Byron L.: *See—*
Black, Dennis A.; and Brucken, Byron L., 3,981,157.

Brugeilles, Gerard: *See—*
Taulier, Hubert Henri Leon; and Brugeilles, Gerard, 3,981,598.

Brumlik, George C. Bristle-like gripping device. 3,981,051, Cl. 24-204.000.

Brunelli, Alessandro: *See—*
Vanelli Coralli, Giorgio; and Brunelli, Alessandro, 3,981,168.

Brunstrom, Gerald R.: *See—*
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Bubniak, William C.; Klomp, Edward D.; Matthes, William R.; and Schilke, Neil A., to General Motors Corporation. Internal combustion engine system. 3,981,279, Cl. 123-41.140.

Buchel, Karl Heinz; Frohberger, Paul-Ernst; Scheinpflug, Hans; and Enders, Edgar, to Bayer Aktiengesellschaft. 2-Alkylphenylhydrazonomidazolenines. 3,981,885, Cl. 260-309.000.

Buchi, George Hermann, to Firmenich S.A. Method for preparing cyclopentenone derivatives. 3,981,920, Cl. 260-593.00R.

Buckley, Keith: *See—*
Mitchell, John Richard; Buckley, Keith; and Burrows, Ian Edward, 3,982,003.

Buckthorpe, George E., to General Motors Corporation. Carrier and clamp assembly for a vehicle window. 3,981,697, Cl. 52-400.000.

Buddenberg, Adolf; Hengst, Bruno; and Weskamp, Josef, to Adolf Buddenberg GmbH. Device for producing plate-shaped workpieces. 3,981,651, Cl. 425-83.000.

Buelow, Fred K.; and Zasio, John J., to Amdahl Corporation. LSI chip construction and method. 3,981,070, Cl. 29-574.000.

Bugnet, Bernard: *See—*
Doniat, Denis; Porta, Augusto; and Bugnet, Bernard, 3,981,747.

Buie, James L., to TRW Inc. Bipolar transistor construction method. 3,981,072, Cl. 29-578.000.

Bull, Dale L.; and Rautiola, Norman A., to Nartron Corporation. Lamp assembly. 3,982,122, Cl. 240-152.000.

Bunda, Tsuchio: *See—*
Noguchi, Masaaki; Bunda, Tsuchio; and Sumiyoshi, Masaharu, 3,981,145.

Bunger, Charles; and Fawess, Edward R. Wave Producing apparatus. 3,981,612, Cl. 416-66.000.

Bunin, Morey. Animated figure. 3,981,097, Cl. 46-126.000.

Bunker Ramo Corporation: *See—*
Avery, Roger P.; and Petti, Pasquale R., 3,982,060.

Bunker, William H.; and Rodriguez, Juan A., to Storage Technology Corporation. Means and method for error detection and correction of digital data. 3,982,226, Cl. 340-146.1AL.

Buoncristiani, Ivano: *See—*
Sabatelli, Silvino; and Buoncristiani, Ivano, 3,981,556.

Burdick, Glen Alden; and Zmuda, Edward Izydor, to GTE Sylvania Incorporated. Rapid warm-up heater circuit. 3,982,153, Cl. 315-8.000.

Burke Company, The: *See—*
Torbet, Philip A.; and Eager, Cyril Thomas, 3,981,469.

Burke, Frederick A.; and Long, Douglas A., to Clairol Incorporated. Hair dryer concentrator. 3,981,313, Cl. 132-9.000.

Burke, Noel Ian, to Tee-Pak, Inc. Alum tanning process for edible collagen casing. 3,982,031, Cl. 426-273.000.

Burkett, Bobby G.; and Henry, Raymond W., to Texas Instruments Incorporated. Programmable logic controller with flag storage. 3,982,230, Cl. 340-172.500.

Burkhardt, Gisbert: *See—*
Klappenecker, Karl; Burkhardt, Gisbert; and Rapparlie, Hans, 3,981,493.

Burns, Richard W., to Hughes Aircraft Company. 180° phase shifting apparatus. 3,982,214, Cl. 333-31.00R.

Burrows, Ian Edward: *See—*
Mitchell, John Richard; Buckley, Keith; and Burrows, Ian Edward, 3,982,003.

Burrows, Norman Bruce. Padding machines. 3,981,089, Cl. 37-142.500.

Buss, Keen W. Fish husbandry system. 3,981,273, Cl. 119-3.000.

Butler, Michael, to American Electronic Laboratories, Inc. Reversible measuring means. 3,982,107, Cl. 235-92.0DN.

Butter, Stephen Allan, to Mobil Oil Corporation. Process of making linear alpha-olefins by ethylene oligomerization. 3,981,941, Cl. 260-683.15D.

Buzzell, Colby E.; and Ziemba, Richard T., to General Electric Company. Electrical setback generator. 3,981,245, Cl. 102-70.2GA.

Byars, Chester W.; Van Cott, Edgar L.; and Orchard, Clifton F., to United States of America, Army. Missile trans porter-launcher. 3,981,224, Cl. 89-1.815.

Byers, William L. Time based monitoring system. 3,982,238, Cl. 340-279.000.

C.A.V. Limited: *See—*
Williams, Malcolm; Crookes, Richard William; and Jones, Christopher Robin, 3,981,287.

Cabut, Louis Antoine; and Huille, Michel Ernest Antoine, to Produits Chimiques Ugine Kuhlmann. Stable pigment compositions. 3,981,734, Cl. 106-20.000.

Cake, Arthur F.: *See—*
Levine, Morris M.; and Cake, Arthur F., 3,981,138.

Calatayud, Jose: *See—*
Montoro, Fernando; Vila-Coro, Antonio; and Calatayud, Jose, 3,982,002.

Caldwell, John W. Foldable furniture. 3,981,532, Cl. 297-42.000.

Callahan, Francis J., Jr.; Gallagher, Bernard J.; Matousek, Stephen; and Koch, Ulrich H., to Whitey Research Tool Co. Fluid system device. 3,981,482, Cl. 251-152.000.

Calvert, Martin A., to Grove Valve and Regulator Company. Method and apparatus for inserting seal rings into restricted grooves. 3,981,066, Cl. 29-451.000.

Calvin, Douglas G.: *See—*
Howard, Curtis E.; and Calvin, Douglas G., 3,981,189.

Camac, Morton, to Aerodyne Research Incorporated. CW shock initiated HF/DF laser. 3,982,208, Cl. 331-94.50G.

Cambridge Filter Corporation: *See—*
Bauder, Carl J., 3,981,192.

Camco, Incorporated: *See—*
Watkins, Fred E.; and Reaux, James R., 3,981,358.

Campbell, John B.; and Tarney, Robert Edward, to Du Pont de Nemours, E. I., and Company. Dehydrohalogenation of 3,4-dichloro-1-butene. 3,981,937, Cl. 260-655.000.

Canale, Raymond P., to General Motors Corporation. Rotary combustion engine two-piece apex seal arrangement. 3,981,643, Cl. 418-119.000.

Cannon, Robert Lee, to American Optical Corporation. Patient stimulating pacer electrode. 3,981,309, Cl. 128-419.00P.

Canon Kabushiki Kaisha: *See—*
Ashida, Akira; and Takahashi, Kiyoshi, 3,981,570.
Goshima, Takeshi; and Endo, Kiyonobu, 3,982,253.
Inoue, Shozo, 3,981,576.
Ito, Tadashi; Nakamoto, Soichi; and Yamada, Sadao, 3,982,254.
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Caporali, Giacomo: *See—*
Brambilla, Giovanni; Caporali, Giacomo; and Zambianchi, Mario, 3,981,960.

Capucio, Eugene G. Blinking reflector signal device. 3,981,263, Cl. 116-63.00P.

Carl Freudenberg, Firma: *See—*
Andorf, Paul; Franz, Dietmar; Lieb, Alfred; Upper, Gerd; and Guttropf, Walter, 3,981,528.

Carlson, Edwin S.: *See—*
Reedy, Charles E.; and Carlson, Edwin S., 3,981,481.

Caroff, Yves Robert, to Facom. Gripping pincers. 3,981,209, Cl. 81-367.000.

Carrier, Vernon J. Pile carpet castor. 3,981,042, Cl. 16-47.000.

Carson, Don B.: *See—*
Kellar, James S.; Carson, Don B.; and Boyd, David M., 3,981,797.

Carson Products Company: *See—*
de la Guardia, Mario, 3,981,681.

Carter, James C. Pump. 3,981,628, Cl. 417-247.000.

Carulio, Paul A., to Torrington Company, The. Thrust bearing with formed thrust washer. 3,981,549, Cl. 308-235.000.

Case Western Reserve University: *See—*
Caston, J. Douglas; and Kamen, Barton A., 3,981,983.

Caspari, Gunter, to Standard Oil Company. Bis-aniline disulfide reaction products as multifunctional lubricating oil additives. 3,981,809, Cl. 252-32.70E.

Caston, J. Douglas; and Kamen, Barton A., to Case Western Reserve University. Rapid, radiochemical-ligand binding assay for methotrexate. 3,981,983, Cl. 424-1.500.

Cataldo, Roy S., to General Motors Corporation. Restraint belt buckle assembly. 3,981,519, Cl. 280-744.000.

Catalyst Research Corporation: *See—*
Bowman, Donald E., 3,981,222.

Caterpillar Tractor Co.: *See—*
Eftefield, Larry G., 3,981,150.
Goloff, Alexander, 3,981,640.
Kluge, Albert E., Jr., 3,981,376.
Laitner, Charles F. A., Jr., 3,981,600.
McLuckie, Walter L., 3,981,148.
Proeschl, Bernard E.; Schell, Ralph C.; and Stanley, James M., 3,981,539.
Rosborough, Dean E., 3,981,515.

CBS Inc.: *See—*
Clark, Forrest W., 3,981,220.

Celli, Charles Jerome Louis; Plattier, Marcel; and Teisseire, Paul Jose, to Societe Anonyme Roure Bertrand Dupont. Cyclopentanone derivatives, odoriferous compositions containing them and process of preparation thereof. 3,981,891, Cl. 260-340.900.

Cenis, Thomas N., to Mele, Joseph J. Liner bushing. 3,981,604, Cl. 408-72.00B.

Cenker, Moses; Narayan, Thirumurti L.; and Kan, Peter T., to BASF Wyandotte Corporation. Process for the preparation of carbodiimide-isocyanurate foams. 3,981,829, Cl. 260-2.5AC.

Central Corsetera S.A.: *See—*
Levy, Jean Michel Bloch, 3,981,670.

Centralny Osrodek Projektowokonstrukcyjny Maszyn Gorniczych "Komag": *See—*
Jedo, Antoni, 3,981,799.

Cezner, Vaclav: *See—*
Rousar, Ivo; Cezner, Vaclav; Franz, Milan; and Matusek, Miroslav, 3,981,490.

Chabardes, Pierre; Gandilhon, Pierre; Grard, Charles; and Thiers, Michel, to Rhone-Poulenc S.A. Preparation of aliphatic dinitriles. 3,981,900, Cl. 260-465.80D.

Chai, Sooyoung, to Bell Telephone Laboratories, Incorporated. Color coding filter for charge-coupled-device camera. 3,982,274, Cl. 358-41.000.

Chamberlin, Earl M.: *See—*
Russ, Warren K., Jr.; Hazen, George G.; and Chamberlin, Earl M., 3,981,888.

Champion International Corporation: *See—*
Weeks, Kenneth D.; and Scoggin, Ronald W., 3,981,475.
Wright, John T., 3,981,537.

Chaney, Louie V.: *See—*
Hull, George Scott; Chaney, Louie V.; and Watson, Richard Dean, 3,981,054.

Channin, Donald Jones, to RCA Corporation. Liquid crystal display. 3,981,559, Cl. 350-160.0LC.

Charles, Daniel; Guyot, Lucien; Reboul, Jean Philippe; and Moiroud, Guy, to Thomson-CSF. Novel target for an ultrasonic wave camera and devices incorporating such a target. 3,982,068, Cl. 178-7.200.

Chazan, Jean Bernard; Coussedière, Daniel; and Gasc, Jean-Claude, to Roussel-UCLAF. Antibiotic aminoglycosides, processes of preparation and pharmaceutical compositions. 3,981,861, Cl. 536-17.000.

Chemische Werke Huls Aktiengesellschaft: *See—*
Frese, Albert; Baxmann, Fritz; and Dittmann, Walter, 3,981,849.
Maiwald, Heinz; Hockele, Gunter; and Sauer, Hermann, 3,981,967.

Chen, Joseph L. P.; and Archer, David H., to United States of America, Energy Research and Development Administration. Agglomerating combustor-gasifier method and apparatus for coal gasification. 3,981,690, Cl. 48-73.000.

Chen, Nai Y.: *See—*
Reagan, William J.; and Chen, Nai Y., 3,981,825.

Chi, Chao S.; McLean, Peter T.; and Field, Norman A., to Digital Equipment Corporation. Phase lock loop with delay circuits for relative digital decoding over a range of frequencies. 3,982,194, Cl. 328-155.000.

Chielens, Alain; and Henin, Jean Pierre, to Fives-Cail Babcock. Apparatus for supporting and cooling a continuously cast product. 3,981,350, Cl. 164-283.00R.

Childs, William V.; and Walters, Harold C., to Phillips Petroleum Company. Electrochemical fluorination process utilizing excess current and hydrogen addition. 3,981,783, Cl. 204-59.00F.

Chisum, Finis Lavell. Apparatus for transporting one vehicle by another. 3,981,408, Cl. 214-506.000.

Chiu, Herman, to Union Carbide Corporation. Process for production of shirred moisturized food casings. 3,981,046, Cl. 17-49.000.

Christensen, Gordon R., to Raymond Lee Organization, Inc., The, a part interest. Reduction wrench holder. 3,981,063, Cl. 29-283.000.

Christie, David A.; and Hobbs, James W., to Phillips Petroleum Company. Automatic control of a hydrocracker. 3,981,793, Cl. 208-108.000.

Christie, Nick J.; and Karnilaw, John, to Diamond Shamrock Corporation. Method for dyeing the jute backing of multilevel nylon carpet without staining the nylon face fibers. 3,981,679, Cl. 8-21.00B.

Chrysler Corporation: *See—*
Gievers, John G., 3,981,587.

Chubb, Anthony Guy, to Pirelli Limited. Resilient platforms for seating. 3,981,538, Cl. 297-454.000.

Chumakov, Mikhail Petrovich: *See—*
Poverenny, Alexandr Mikhailovich; Semin, Jury Alexeevich; Chumakov, Mikhail Petrovich; Gagarina, Antonina Vasilievna; Khanina, Maria Kronidovna; Tkachenko, Evgeny Alexandrovich; and Bashkirtsev, Vyacheslav Nikolaevich, 3,981,772.

Chupick, Ronald, to General Motors Corporation. Energy absorbing permanently deformable collapsible column. 3,981,114, Cl. 52-232.000.

Churchill, John W. Bilateral heater unit and method of construction. 3,982,099, Cl. 219-544.000.

Chvertko, Anatoly Ivanovich: *See—*
Medovar, Boris Izrailevich; Saenko, Vladimir Yakovlevich; Schupak, Grigory Bentsionovich; Alferov, Jury Fedorovich; Karpov, Vladimir Fedorovich; Berman, Kirill Adolfovich; Pogoretsky, Vitaly Vasilievich; Ovseichuk, Vitaly Alexandrovich; Zabolotsky, Petr Stepanovich; Boiko, Georgy Alexandrovich; Oleinik, Vladimir Ivanovich; Grodzitsky, Stanislav Vitalievich; Popov, Viktor Andreevich; and Chvertko, Anatoly Ivanovich, 3,981,349.

Ciano, John A., to Interconsal Associates, Inc. Tweezers for use with semi-conductor wafers. 3,981,527, Cl. 294-99.00R.

Ciba-Geigy AG: *See—*
Mayer, Fritz; Kern, Jorg; and Nachbur, Hermann, 3,982,053.
Renner, Alfred, 3,981,845.

Ciba-Geigy Corporation: *See—*
Drabek, Jozef, 3,982,015.
Hool, Gerhard; and Kundig, Hans, 3,982,022.
Lohse, Friedrich; Munk, Kurt; and Rembold, Heinz, 3,981,898.
Petree, Harris E.; and Stutts, Joseph W., 3,981,712.
Werner, Lincoln Harvey, 3,982,018.

Cidade, Humberto Jose De Carvalho. Method of recording bets in a lottery and selecting the winners by electronic computers. 3,982,102, Cl. 235-61.60E.

Cimarusti, Christopher M.: *See—*
Hauck, Frederic P.; Cimarusti, Christopher M.; and Narayanan, Venkatachala L., 3,982,021.

Cincinnati Milacron, Inc.: *See—*
Cox, Joseph Henry, 3,982,085.
Edwards, Bobbie Lee, 3,981,671.
Kelly, Ralph; and Ritter, Edmond Jean, 3,981,990.
Nashold, Robert Wilfred, 3,981,606.

Cinzori, Robert J.: *See—*
Berry, Clyde Raymond; and Cinzori, Robert J., 3,982,173.

Cirri, Gianfranco; and Fidanzati, Giovanni, to Fabbrica Italiana Magneti Marelli, S.p.A. Process of thermistor manufacture. 3,981,071, Cl. 29-573.000.

Cities Service Company: *See—*
Myers, Claude V., 3,981,659.

CJB Development Limited: *See—*
Leppard, Colin James, 3,981,698.

Clairol Incorporated: *See—*
Burke, Frederick A.; and Long, Douglas A., 3,981,313.
Halasz, Alexander; Brody, Frederick, deceased; and Newman, Richard, executor, 3,981,677.

Clarebout, Pierre M.: *See—*
Vanhoof, Pierre M.; and Clarebout, Pierre M., 3,981,872.

Clark Equipment Company: *See—*
Johns, Robert C., Jr., 3,981,374.
Visser, Peter J., 3,981,514.

Clark, Forrest W., to CBS Inc. Snare drum with tone ring. 3,981,220, Cl. 84-415.000.

Clark, James Monroe, to International Telephone and Telegraph Corporation. Automatic channel assignment circuit. 3,982,074, Cl. 179-15.0BV.

Clark, James Monroe; Cohen, Stuart Barry; and Magnus, Arthur Howard, to International Telephone and Telegraph Corporation. Asynchronous multiplexer and demultiplexer combination. 3,982,077, Cl. 179-15.0BV.

Clark, John C.: *See—*
Phillipps, Gordon H.; Bain, Brian M.; and Clark, John C., 3,981,894.

Clayton, John Peter; and Ferres, Harry, to Beecham Group Limited. Penicillin monoesters, their production and intermediates thereof. 3,981,866, Cl. 260-239.100.

Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Deep diode varactors. 3,982,270, Cl. 357-60.000.

Cline, Harvey E.: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 3,982,268.

Cline, Virgil A., Jr.: *See—*
Kalb, Henry T.; Cline, Virgil A., Jr.; and Bomar, Bruce W., 3,982,101.

Close, Albert R.: *See—*
Henderson, Cyril; and Close, Albert R., 3,981,535.

Coad, Peter; Murray, Edward Conley; and Reed, Homer Charles, to Kerr-McGee Chemical Corporation. Method for producing an alkali metal pyrophosphate. 3,981,974, Cl. 423-315.000.

Coaton, James Richard: *See—*
Mason, David Robert; Cole, Susan Margaret; Rees, John Michael; and Coaton, James Richard, 3,982,046.

Cochran, Larry Allen, to RCA Corporation. Switching arrangement for flesh tone correction and chrominance overload control circuits. 3,982,273, Cl. 358-27.000.

Cohen, Diana: *See—*
Hoeflinger, Irene Burns; and Cohen, Diana, 3,981,086.

Cohen, Stuart Barry: *See—*
Clark, James Monroe; Cohen, Stuart Barry; and Magnus, Arthur Howard, 3,982,077.

Cohn, Bernard. Shaving cream dispenser. 3,981,597, Cl. 401-190.000.

Coldren, Larry Allen, to Bell Telephone Laboratories, Incorporated. Acoustoelectric wave semiconductor signal processing apparatus with storage of weighting factor. 3,982,113, Cl. 235-181.000.

Cole, Susan Margaret: *See—*
Mason, David Robert; Cole, Susan Margaret; Rees, John Michael; and Coaton, James Richard, 3,982,046.

Collineau, Claude Jean; and Pontigny, Jacques Andre, to Coulter Electronics, Inc. Particle sizing apparatus. 3,982,183, Cl. 324-71.0CP.

Collins, John, to McWhirter, Jerry L. Stunning and overload circuit. 3,981,045, Cl. 17-1.00E.

Colorcon Incorporated: *See—*
Signorino, Charles A., 3,981,984.

Combustion Engineering, Inc.: *See—*
McAllister, Owen Earl, 3,981,103.

Commissariat a l'Energie Atomique: *See—*
Bathellier, Andre; and Germain, Michel, 3,981,961.
Lalis, Andre; Rouviere, Rene; and Simon, Gilbert, 3,981,696.
Nicolas, Gerard, 3,981,076.
Poujois, Robert, 3,982,196.

Compagnie Francaise de Raffinage: *See—*
Bezaudun, Jean; and Weisang, Joseph Edouard, 3,981,746.
Scherrer, Claude-Jacques; Mauleon, Jean-Louis; and Gmerek, Jean-Daniel, 3,981,780.

Concast AG: *See—*
Willim, Fritz, 3,981,347.

Considine, William Howard, to A.P.V. Company Limited, The. Bearing wear detection devices. 3,981,621, Cl. 417-44.000.

Consiglio Nazionale delle Richerche: *See—*
Papoff, Paolo; and Morelli, Basilio, 3,981,487.

Consolidated Foods Corporation: *See—*
Arden, Sidney, 3,982,042.

Consolidated Refining Company, Inc.: *See—*
Prasad, Janniah S., 3,981,724.

Conti, Paolo; and Bianchi, Massimo, to Billi, S.p.A. Panty hose with reinforced longitudinal waist opening. 3,981,161, Cl. 66-177.000.

Continental Oil Company: *See—*
Doerr, Richard E.; McCain, David L.; and Dahl, Hilbert D., 3,981,541.
McClaflin, Gifford G.; and Durr, Albert M., Jr., 3,981,808.
Pace, Gerald F.; Stauter, John C.; Armstrong, Calvin N.; and Harris, Gary R., 3,981,784.
Reynolds, David E., 3,982,217.

Contractor, Rashmikant M.; and Hwang, Sang-Hak, to Du Pont de Nemours, E. I., and Company. Apparatus for forming a batt from staple fibers. 3,981,047, Cl. 19-155.000.

Contraves AG: *See—*
Stutz, Theo, 3,982,106.

Conville, David J.; and Crane, Burke J., to Rixson-Firemark, Inc. Combination door chime and particulate products of combustion detector. 3,982,237, Cl. 340-237.500.

Cook, Newell C.; and Davis, Gary C., to General Electric Company. Process for making dinitrotoluene. 3,981,933, Cl. 260-645.000.

Cook Testing Co.: *See—*
Marathe, Anil, 3,981,360.

Cooke, George A.; and Houlihan, William J., to Sandoz, Inc. 2-(N-thiocarbamoyl-n-substituted-amino)-3,4-methylenedioxy benzhydrols. 3,981,890, Cl. 260-340.500.

Cooke, Robert John: *See—*
Dorey, Howard Anthony; and Cooke, Robert John, 3,982,061.

Coon, Clifford L., to Koppers Company, Inc. Preparation of anhydrous nitric acid. 3,981,975, Cl. 423-390.000.

Cooper, Glenn D.: *See—*
Abolins, Visvaldis; Cooper, Glenn D.; and Lee, Gim F., Jr., 3,981,841.

Cooperstein, Norman, to Raymond Lee Organization, Inc., The, a part interest. Shockproof electrical wall receptacle. 3,982,084, Cl. 200-51.090.

Copeland, John Alexander, III, to Bell Telephone Laboratories, Incorporated. Voltage maintenance apparatus. 3,982,141, Cl. 307-296.000.

Coratomic Inc.: *See—*
Purdy, David L., 3,981,750.

Cornelius Company, The: *See—*
Kovar, Henry Charles, 3,981,384.

Corning Glass Works: *See—*
Adler, Meryle D. W.; and Brown, John T., 3,982 218.
Araujo, Roger J.; Borrelli, Nicholas F.; Crow, John D.; and Seward, Thomas P., III, 3,981,707.
Gigliello, Joseph F., 3,981,804.
Ludovici, Bruno F.; and Megla, Gerhard K., 3,982,151.
Orso, Francis L.; and Piazza, Giacomo J., 3,981,657.

Cornwell, Alexander M., Jr., to Jackes-Evans Manufacturing Company. Mailbox door mounting arrangement. 3,981,413, Cl. 220-334.000.

Cosgrove, James F.: *See—*
McCain, William B.; Cosgrove, James F.; and Bewersdorf, Elmer D., 3,981,212.

Coulter Electronics, Inc.: *See—*
Collineau, Claude Jean; and Pontigny, Jacques Andre, 3,982,183.
Hogg, Walter R., 3,982,182.

Coulthard, John Louis. Method and apparatus for anaerobic fermentation. 3,981,803, Cl. 210-178.000.

Council of the Institute of Medical and Veterinary Science, The: *See—*
Baker, Richmond J.; and Bellen, Johan C., 3,981,980.

Coussediere, Daniel: *See—*
Chazan, Jean Bernard; Coussediere, Daniel; and Gasc, Jean-Claude, 3,981,861.

Covini, Romano: *See—*
Battiston, Giancarlo; Petrini, Guido; De Alberti, Giordano; and Covini, Romano, 3,981,912.

Cox, Joseph Henry, to Cincinnati Milacron, Inc. Stock sensing device. 3,982,085, Cl. 200-61.410.

Crane, Burke J.: *See—*
Conville, David J.; and Crane, Burke J., 3,982,237.

Crane, Glen Robert: *See—*
Bergman, John George, Jr.; Crane, Glen Robert; and Guggenheim, Howard Joseph, 3,982,136.

Crawford, John T., to Towmotor Corporation. Vehicle hood assembly. 3,981,375, Cl. 180-69.00C.

Creare, Incorporated: *See—*
Hawkes, Ivor, 3,981,540.

Crecelius, John D.: *See—*
Krey, John F.; Regelson, Ephraim; and Crecelius, John D., 3,981,449.

Crino, Arthur D., to Allis-Chalmers Corporation. Contact system for an outdoor electrical switch. 3,982,083, Cl. 200-48.00A.

Crivello, James V., to General Electric Company. Method for making certain halonium salt photoinitiators. 3,981,897, Cl. 260-440.000.

Crochet, Gerald J., Sr. Coupling mechanism adapted to latch object to object substantially coterminously with uncovering universal movement means between objects. 3,981,517, Cl. 280-478.00R.

Crofton, John Walter, to Deering Milliken Research Corporation. Wet mop construction having pile fabric mopping element. 3,981,040, Cl. 15-229.00A.

Crookes, Richard William: *See—*
Williams, Malcolm; Crookes, Richard William; and Jones, Christopher Robin, 3,981,287.

Crookshanks, Rex John, to Ampex Corporation. Core memory with improved sense-inhibit recovery time. 3,982,233, Cl. 340-174.0DC.

Crouch, William R. Apparatus for holding a paint brush. 3,981,399, Cl. 206-15.200.

Crow, John D.: *See—*
Araujo, Roger J.; Borrelli, Nicholas F.; Crow, John D.; and Seward, Thomas P., III, 3,981,707.

CTS Corporation: *See—*
Rozema, Arthur L.; Van Benthuysen, John D.; and Zdanys, John, 3,982,220.

Cuff, David William, to Leesona Corporation. Pelletizing method. 3,981,959, Cl. 264-142.000.

Cululi, John J.; and Ash, Glenn R. Bicycle frame mounted rear view mirror. 3,981,567, Cl. 350-307.000.

Cummins, Donald L., to General Motors Corporation. Excitation system for a self-excited alternator. 3,982,169, Cl. 322-28.000.

Cuneo, Edward A., to Minnesota Mining and Manufacturing Company. Metal-clad dielectric sheeting having an improved bond between the metal and dielectric layers. 3,981,691, Cl. 29-195.000.

Curran, Adrian Charles Ward, to John Wyeth & Brother Limited. 4-phenylmercaptopiperidine nitriles. 3,981,878, Cl. 260-293.730.

Currier, Robert F. Hanger device. 3,981,471, Cl. 248-317.000.

Curry, Christian O. Slidable tool grip. 3,981,043, Cl. 16-110.00R.

Curtis, Terry W. Horse walker having a continuously variable transmission and folding booms. 3,981,274, Cl. 119-29.000.

Curtiss-Wright Corporation: *See—*
Haberski, Richard J., 3,981,354.

Cusic, John W.; Ellefson, Charles R.; and Woo, Chi Min, to G. D. Searle & Co. 2-Substituted-9-phenyl-2,3,4,4a,9,9a-hexahydro-1H-indeno[2,1-c]pyridines and related compounds. 3,981,875, Cl. 260-293.540.

Custer, Warren L. Variable volume air wall. 3,981,445, Cl. 237-1.00A.

Czajkowski, George J., to Universal Oil Products Company. Method for the removal and inhibition of metal scale formation in a hydrocarbon processing unit. 3,981,740, Cl. 134-2.000.

Czajkowski, Norman; and McMann, John H. S., to United States of America, Navy. Fluidic link master/slave fuze system. 3,981,239, Cl. 102-7.200.

Czebiniak, Walter N., to GAF Corporation. Photographic plate developer apparatus. 3,982,258, Cl. 354-300.000.

D-J Enterprises, Inc.: *See—*
Rumph, Joel D., 3,981,039.

Dahl, Hilbert D.: *See—*
Doerr, Richard E.; McCain, David L.; and Dahl, Hilbert D., 3,981,541.

Dahltron Corporation: *See—*
Wickenberg, Chester H., 3,981,625.

Dai Nippon Co., Ltd.: *See—*
Kato, Haruhiro; Toyoda, Tsunehiko; and Tanabe, Hiroyuki, 3,982,050.

Daicel, Ltd.: *See—*
Yoshizaki, Hiroyuki; Takanohashi, Hiromitsu; Masuda, Yoshitaka; Hozumi, Yukio; Ohi, Akira; and Sonpyama, Yuzo, 3,981,843.

Daimler-Benz Aktiengesellschaft: *See—*
Blum, Josef; Lamm, Heinz; and Sprang, Alfred, 3,981,644.
Helmer, Josef, 3,981,614.

Dainippon Jochugiku Kabushiki Kaisha: *See—*
Katsuda, Yoshio, 3,982,013.

Dainippon Pharmaceutical Co., Ltd.: *See—*
Shimizu, Masanao; Takase, Yoshiyuki; and Kouno, Kaoru, 3,981,999.

Daiwa Boseki Kabushiki Kaisha: *See—*
Miyazaki, Tsutomu; Kato, Takashi; and Miyamoto, Noriaki, 3,981,132.

Dake, Norman W. Prefabricated stair construction. 3,981,112, Cl. 52-184.000.

Dalgleish, Jack Frank. Container for coins and similar disc shaped members. 3,981,395, Cl. 206-.820.

D'Amato, Michael A. Hydraulic motor with orbiting drive member. 3,981,641, Cl. 418-61.00R.

Damberg, Ejvind, to A/S Raaco Storage Systems. Arrangement at corner joints in a knock-down shelving unit. 3,981,251, Cl. 108-154.000.

Dan River Inc.: *See—*
Pangle, James C., Jr.; and Hicks, Alton D., 3,981,836.

Danford, Jack Dewayne. Grain storage and shipping containers. 3,981,083, Cl. 34-19.000.

Danfoss A/S: *See—*
Brown, Alvin E.; and Thun, Niels, 3,981,191.
Vind, Holger Wilhelm, 3,981,075.

Daniel, Bryan D.: *See—*
Daniel, Wayne A.; and Daniel, Bryan D., 3,981,506.

Daniel, Wayne A.; and Daniel, Bryan D., to Vesta. Three dimensional relief puzzle. 3,981,506, Cl. 273-157.00R.

Daniels, Lowell W.: *See—*
Luebke, Clem J.; Beck, Norman L.; and Daniels, Lowell W., 3,981,044.

Dansk Industri Syndikat A/S: *See—*
Lundsgart, Henning Borge, 3,981,478.

Dansk Landbrugs Grovvareselskab A.m.b.A.: *See—*
Valeur, Claus Michael; Bisgaard-Jespersen, Peter; and Schroder, Henning Bernstorff, 3,982,027.

Darda, Helmut. Toy vehicle with component for storing energy in response to motion in opposite directions. 3,981,098, Cl. 46-206.000.

Dashevsky, Zinovy Moiseevich; Kaller, Yakov Alexandrovich; Kolomoets, Nikolai Vasilievich; and Sgibnev, Igor Vladimirovich. Thermoelement and thermopile based thereon. 3,981,751, Cl. 136-225.000.

Dauphinais, Henry F. Shoulder strap retainer. 3,981,050, Cl. 24-76.000.

Davies, Terrence Ardern: *See—*
Douglas, Peter; Pedder, David John; Swallow, Peter John; and Davies, Terrence Ardern, 3,981,726.

Davis, Gary C.: *See—*
Cook, Newell C.; and Davis, Gary C., 3,981,933.

Davis, Howard G.; Hovey, Emerson B.; and Sylvester, Edwin E., to USM Corporation. Method for bonding resin film to metal. 3,981,762, Cl. 156-322.000.

Davis, Robert Elliott; and Weck, Friedrich Josef, to Kerr-McGee Corporation. Method of separating methylolphenols from solutions. 3,981,929, Cl. 260-621.00K.

Dayco Corporation: *See—*
Dodson, Walter L., 3,981,059.
Miranti, Joseph P., Jr.; and Woodland, Carl R., 3,981,206.

de la Guardia, Mario, to Carson Products Company. Depilatory formulation. 3,981,681, Cl. 8-161.000.

De Laval Turbine Inc.: *See—*
Bachman, Albert J., 3,982,087.

De Alberti, Giordano: *See—*
Battiston, Giancarlo; Petrini, Guido; De Alberti, Giordano; and Covini, Romano, 3,981,912.

Dean, Jerald L. Phone aid timing device. 3,982,072, Cl. 179-2.0TC.

de Buhr, Alfred P.; and Meyer, Bruce R., to General Motors Corporation. Locomotive wheel slip control. 3,982,164, Cl. 318-52.000.

Deering Milliken Research Corporation: *See—*
Crofton, John Walter, 3,981,040.

de Haan, Maarten Rutger: *See—*
Verhoeven, Leonardus Adrianus Johannes; de Haan, Maarten Rutger; and Janssen, Peter Johannes Michiel, 3,982,272.

Dehlen, Bengt Lars Arne, to Trelleborgs Gummifabrik Aktiebolag. Lining and fastener arrangement for devices having surfaces subject to wear. 3,981,117, Cl. 52-509.000.

Dehnert, Johannes, to BASF Aktiengesellschaft. Sulfur containing dyes of the quinonaphthalone series. 3,981,873, Cl. 260-289.00H.

Delbar Products, Inc.: *See—*
Szilagyi, Jane M., 3,981,474.

Deminet, Czeslaw; and Gillette, Roger B., to Boeing Company, The. All glass composite building panels. 3,981,294, Cl. 126-271.000.

Demler, Henry William, Jr., to AMP Incorporated. Keyboard assembly with overlapped flexible printed circuit cable switch. 3,982,081, Cl. 200-5.00R.

Demogenes, Christos; and Stone, Robert A., to Garrett Corporation, The. Cooled infrared suppressor. 3,981,448, Cl. 239-127.300.

Demole, Edouard P., to Firmenich S.A. Aromatic compositions. 3,981,311, Cl. 131-144.000.

Demou, John G.; Pizzini, Louis C.; and Patton, John T., Jr., to BASF Wyandotte Corporation. Flexible cellular polyurethane foam compositions having increased flame retardance. 3,981,828, Cl. 260-2.5AC.

Den Herder, Marvin J.; and Warne, Thomas Martin, to Standard Oil Company (Indiana). Hydraulic fluid. 3,981,813, Cl. 252-75.000.

Denisova, Maria Vasilievna: *See—*
Aimbinder, Mark Borisovich; Zhitomirsky, Mikhail Iosifovich; Denisova, Maria Vasilievna; Grabilin, Anatoly Mikhailovich; Lapushkin, Grigory Alexeevich; Kupershmidt, Moisei Zusicvich; Mazov, Jury Alexeevich; Terentiev, Viktor Petrovich; Sergeev, Jury Vasilievich; and Muzylev, Vladimir Sergeevich, 3,981,130.

Dennis, Richard Kay; and Hadden, Edward Leal, to Du Pont de Nemours, E. I., and Company. Leadless package retaining frame. 3,982,159, Cl. 317-101.0CC.

Deschler, Gerhard; Wittmann, Dieter; and Trier, Reinhold, to Maschinenfabrik Augsburg-Nurnberg AG. Cam for controlling valves of an internal combustion engine. 3,981,281, Cl. 123-90.600.
Desler, Duane A.: *See—*
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DeVault, Robert; and Maloof, Ralph, to Sidewinder Marine, Inc. Water jet propulsion apparatus. 3,981,262, Cl. 115-12.00R.
DeVito, George, to Brady, Arthur M. Counterbalancing mechanism for rolling doors. 3,981,343, Cl. 160-9.000.
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de Wit, Michiel, to Texas Instruments Incorporated. Method of preventing post pulsing of Q-switched laser. 3,982,203, Cl. 331-94.50Q.
Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof. 3,981,932, Cl. 260-645.000.
Diamond Shamrock Corporation: *See—*
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Di Bella, Eugene P.; Keyworth, Donald A.; and Rosen, Marvin, to Tenneco Chemicals, Inc. Flame-retardant emulsion containing 1,1,2,3,4-,4-hexabromobutene-2. 3,981,806, Cl. 252-8.100.
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Di Maio, Anthony E.; and Swier, Willem, to Marson Fastener Corporation. Compressed air rivet setting tool. 3,981,177, Cl. 72-391.000.
Dingle, Raymond; and Henry, Charles Howard, to Bell Telephone Laboratories, Incorporated. Quantum effects in heterostructure lasers. 3,982,207, Cl. 331-94.50H.
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Dodson, Walter L., to Dayco Corporation. Textile cot. 3,981,059, Cl. 29-127.000.
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Donaghy, James G., to International Playtex, Inc. Molded brassiere cups. 3,981,310, Cl. 128-464.000.
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Doris, Thomas A., Jr., to United States of America, Army. Projectile. 3,981,243, Cl. 102-52.000.
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Dragerwerk Aktiengesellschaft: *See—*
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Dudley, Robert E., to Tracey, Richard M.; and Brunstrom, Gerald R., part interest to each. Airport terminal. 3,981,464, Cl. 244-114.00R.
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Dunn, Karl L.; and Reynolds, Gordon S., to Sorenson Research Co., Inc. Gas sampling catheter assembly and method. 3,981,297, Cl. 128-2.00G.
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Eberly, Paul E., to Exxon Research and Engineering Company. Aromatization process and catalysts. 3,981,794, Cl. 208-138.000.

Eckstein, Gershon. Irrigation pipes with dripper units and method of its manufacture. 3,981,452, Cl. 239-542.000.

Ecology Control, Inc.: *See—*
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Edwards, John A., to Syntex (U.S.A.) Inc. Thiazole cardiovascular agents. 3,982,010, Cl. 424-270.000.

Eernisse, Errol P.; and Peterson, Gary D., to United States of America, Energy Research and Development Administration. Variable gas leak rate valve. 3,981,480, Cl. 251-129.000.

Eftefield, Larry G., to Caterpillar Tractor Co. Dual hydraulic motor drive system. 3,981,150, Cl. 60-425.000.

Ehrenskjold, Nils Oluf; and Munk, Torben, to Gori-Vaerk A/S. Foldable propellers. 3,981,613, Cl. 416-142.000.

Eigenmann, Ludwig. Light retroreflective system for sign surfaces. 3,981,557, Cl. 350-104.000.

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Fein, Michael E., to Owens-Illinois, Inc. Saturated photon conditioning of multiple gaseous discharge panel. 3,982,155, Cl. 315-169.0TV.

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Flaherty, John W.; Ingersoll, Robert C.; and Goodrich, William F., to Dick Blick Company. Lapidary apparatus. 3,981,105, Cl. 51-71.000.

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Flanagan, Thomas L., to Emhart Industries, Inc. Apparatus for applying adhesive to carton flaps. 3,981,123, Cl. 53-374.000.

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Fletcher, Gerald M., to Xerox Corporation. Non-uniform charging of sheet material. 3,981,498, Cl. 271-193.000.

Fletcher, John Milford. Process for continuously fixing vat dyes on a textile web. 3,981,680, Cl. 8-34.000.

Fleury, Gerard; and Fourcade, Marc Camille Alexandre, to Societe Nationale Industrielle Aerospatiale. System for controlling the position of the anchorage point of the piloting channel of an aircraft. 3,981,461, Cl. 244-17.130.

Flex-O-Lators, Inc.: *See—*
MacMorran, Robert D.; Tieman, Lloyd E.; and McQuitty, Raymond L., 3,981,034.

Floyd, Middleton Brawner, Jr.: *See—*
Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 3,981,868.

FMC Corporation: *See—*
Avramidis, Stellios A.; and Partridge, William T., 3,981,205.
Forcella, Peter W., 3,981,660.
Lobunez, Walter; and Berkowitz, Sidney, 3,981,939.

Fogelberg, Mark J.; and Hill, Frank E., to Borg-Warner Corporation. Variable ratio master cylinder. 3,981,146, Cl. 60-574.000.

Fokker-V.F.W. B.V.: *See—*
Godfried, Leo M., 3,981,832.

Forcella, Peter W., to FMC Corporation. Apparatus for cutting slices of semi-frozen food products. 3,981,660, Cl. 425-232.000.

Ford, Eric Harold, to Lumenition Limited. Ignition systems and fuel injection systems for internal combustion engines. 3,981,282, Cl. 123-117.00R.

Ford Motor Company: *See—*
Andre, Lee R., 3,981,380.
Ernest, Robert P., 3,981,276.
Kaufman, Warren F., 3,981,283.
Moskowitz, David; and Uy, James C., 3,981,062.
Telang, Yeshwant P.; and Uy, James C., 3,981,688.

Forney Engineering Company: *See—*
Forney, Ross H.; and Paredes, Candelario, 3,981,195.

Forney, Joseph M.: *See—*
Bauer, John R.; and Forney, Joseph M., 3,981,341.

Forney, Ross H.; and Paredes, Candelario, to Forney Engineering Company. Silo level measuring system. 3,981,195, Cl. 73-296.000.

Forster, Friedrich M. O. Magnetic gradient detector with means for adjusting the parallelism of the sensors. 3,982,179, Cl. 324-43.00G.

Fort Howard Paper Company: *See—*
Sobota, John T., 3,981,084.

Fortenberry, Dewitt L., to UOP Inc. Centralizer element for well screen. 3,981,359, Cl. 166-241.000.

Foster, Frank L.; and Wilcox, Wayne E., to Snap-Tite, Inc. Check valve. 3,981,479, Cl. 251-63.600.

Foster, Lawrence. Dispensing cart. 3,981,511, Cl. 280-79.300.

Fourcade, Marc Camille Alexandre: *See—*
Fleury, Gerard; and Fourcade, Marc Camille Alexandre, 3,981,461.

Fournier, Wilfred A.; and Rieser, Elmer P., to Owens-Corning Fiberglas Corporation. Method and apparatus for processing glass. 3,981,704, Cl. 65-2.000.

Fowler, John Rayford; and Hogan, Edward Merrick, to Du Pont de Nemours, E. I., and Company. Dispenser with expansible member and contracting fabric. 3,981,415, Cl. 222-95.000.

Foxboro Company, The: *See—*
Prescott, Robert C., 3,981,318.

France Bed Co. Ltd.: *See—*
Toda, Kooichiro, 3,981,033.

Frangos, Peter W. Safety matchbook. 3,981,396, Cl. 206-109.000.

Frank, Lee F.; and Lee, James K., to Eastman Kodak Company. Lever-action mountings for beam steerer mirrors. 3,981,566, Cl. 350-285.000.

Frank, Ralph E., Jr.: *See—*
Thornhill, Dewey B.; and Frank, Ralph E., Jr., 3,981,433.

Franke, Walter. Two-stroke combustion engines. 3,981,280, Cl. 123-69.00R.

Frankel, Milton B.; and Dickinson, Lionel A., to United States of America, Army. Triaminoguanidine cyanoformate. 3,981,899, Cl. 260-465.50R.

Franklin, Stanley; and Jaffe, Herbert, to Franklin, Stanley; Jaffe, Herbert; and Athey, Harold, part interest to each. Automatic necktic neckband tacker. 3,981,254, Cl. 112-104.000.

Franko, Eugene B., to Xerox Corporation. Air stripping device for elastomeric surface. 3,981,085, Cl. 355-3.00R.

Fransen, Billy G.: *See—*
Shinn, Michael G.; and Fransen, Billy G., 3,982,185.

Franz, Dietmar: *See—*
Andorf, Paul; Franz, Dietmar; Lieb, Alfred; Upper, Gerd; and Guttropf, Walter, 3,981,528.

Franz, Milan: *See—*
Rousar, Ivo; Cezner, Vaclav; Franz, Milan; and Matusek, Miroslav, 3,981,490.

Franz Plasser Bahnbaumaschinen-Industrie-gesellschaft m.b.H.: *See—*
Theurer, Josef, 3;981,247.

Freeman. Lawrence M.; and Arnold, Francis T. Drive system for shifting a mirror assembly. 3,981,581, Cl. 355-44.000.

Freeport Minerals Company: *See—*
Miller, David J.; and Wiewiorowski, Tadeusz K., 3,981,968.

Frese, Albert; Baxmann, Fritz; and Dittmann, Walter, to Chemische Werke Huls Aktiengesellschaft. Low pressure process for the production of low density co- and terpolymers of ethylene. 3,981,849, Cl. 526-82.000.

Freund, Michael C.: *See—*
Seider, Gene J.; and Freund, Michael C., 3,982,097.

Freytag, Johannes; and Konermann, Hans-Ewald, to Dynamit Nobel Aktiengesellschaft. Workable and thermal stable interpolymers of dicarboxylic acid esters and vinyl chloride. 3,981,846, Cl. 526-227.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Blum, Josef; Lamm, Heinz; and Sprang, Alfred, 3,981,644.
Koppers, Kurt, 3,981,057.
Neubert, Rolf; Schiebenhofer, Harm; and Wehling, Rolf, 3,981,133.

Frohberger, Paul-Ernst: *See—*
Buchel, Karl Heinz; Frohberger, Paul-Ernst; Scheinpflug, Hans; and Enders, Edgar, 3,981,885.

Fuchs, Heinrich. Electronic dust separator system. 3,981,695, Cl. 55-138.000.

Fuji Oil Company, Ltd.: *See—*
Hashimoto, Yukio; and Sunada, Fumiyuki, 3,982,025.
Obata, Shizuo; Yamato, Yukiomi; and Taniguchi, Hitoshi, 3,982,004.

Fuji Photo Film Co., Ltd.: *See—*
Emoto, Takeo; and Kurihara, Satoshi, 3,981,732.
Kiritani, Masataka; and Ogata, Yasuhiro, 3,981,821.
Matsuyama, Junichi; Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Ohi, Reiichi; and Kondo, Tokiharu, deceased, 3,982,044.

Fuji Photo Optical Co., Ltd.: *See—*
Togashi, Shiyuichi, 3,982,257.

Fuji Xerox Co., Ltd.: *See—*
Okada, Ryuzo; Nagashima, Toshio; Kito, Hidetoshi; Tsukamoto, Takuzo; Nakaguchi, Michiharu; and Handa, Kenichi, 3,981,271.
Tsukamoto, Takuzo; Nakaguchi, Mitsuharu; Kito, Hidetoshi; Nagashima, Toshio; Shirata, Akihiko; and Tsuda, Shinichi, 3,981,268.
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Fujimori, Masahiro: *See—*
Yamamoto, Katsumi; Fujimori, Masahiro; Fujinawa, Masahiro; and Sonoda, Sanenobu, 3,981,074.

Fujinawa, Masahiro: *See—*
Yamamoto, Katsumi; Fujimori, Masahiro; Fujinawa, Masahiro; and Sonoda, Sanenobu, 3,981,074.

Fujio, Ryota; Kataoka, Nobuyuki; Fukabori, Yoshihide; and Anzai, Shiro, to Bridgestone Fire Company Limited. Rubber compositions of polyisoprene α-methylstyrene, divinylbenzene and dialkyl peroxide. 3,981,943, Cl. 260-880.00R.

Fujita, Masao; Akiyama, Takuya; Saeki, Yoshito; and Ueno, Yasuhiko, to Ogawa & Co., Ltd. Method of manufacturing cis,cis-2,4,6-triisopropyl-1,3,5-trioxane. 3,981,889, Cl. 260-340.000.

Fujita, Yoshiji: *See—*
Nishida, Takashi; Ninagawa, Yoichi; Omura, Yoshiaki; Mori, Fumio; Tamai, Yoshin; Hosogai, Takeo; Fujita, Yoshiji; and Itoi, Kazuo, 3,981,930.

Fujiwara, Takao: *See—*
Tanaka, Susumu; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 3,981,575.

Fukabori, Yoshihide: *See—*
Fujio, Ryota; Kataoka, Nobuyuki; Fukabori, Yoshihide; and Anzai, Shiro, 3,981,943.

Fukai, Masakazu: *See—*
Moriyama, Akio; Fukai, Masakazu; Asai, Komei; and Mori, Koshiro, 3,981,816.

Fukuda, Masataro; Iwaki, Tsutomu; and Kawano, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Gas diffusion electrode for a battery. 3,981,749, Cl. 429-41.000.

Fukuoka, Yohei; Kato, Toshio; Imai, Norio; Nishikido, Joji; Hamada, Masato; Mikami, Hiroshi; Iwasaki, Hirohumi; and Koike, Toshihisa, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing alkyl 4,4'-(ethylenedioxy)bis-benzoates. 3,981,906, Cl. 260-473.00R.

Fulton, Ronald T.: *See—*
Moody, Roy A.; and Fulton, Ronald T., 3,981,048.

Funston, Nelson Edward, to Boeing Company, The. Quick egress from deep underground. 3,981,152, Cl. 61-.500.

Furukawa Electric Co., Ltd., The: *See—*
Shimano, Takashi; Orimo, Katsumi; Yamamoto, Shoji; and Azuma, Masao, 3,981,649.

Furuno, Hiroshi, to Sony Corporation. FM receiver with detector for multi-path reception. 3,982,186, Cl. 325-344.000.

G. A. Serlachius Oy: *See—*
Turunen, Lasse Juhani; Rimpinen, Heikki; Orsma, Tauno; and Peurala, Aimo, 3,981,121.

G. D. Searle & Co.: *See—*
Cusic, John W.; Ellefson, Charles R.; and Woo, Chi Min, 3,981,875.
Groch, Mark W.; and Whitehead, Frank R., 3,982,128.
Jupa, Edward C.; Meeder, Raymond L.; and Richter, Edward K., 3,982,133.

G & S Metal Products Inc.: *See—*
Guzzi, Anthony, 3,981,101.

GAF Corporation: *See—*
Czebiniak, Walter N., 3,982,258.

Gagarina, Antonina Vasilievna: *See—*
Poverenny, Alexandr Mikhailovich; Semin, Jury Alexeevich; Chumakov, Mikhail Petrovich; Gagarina, Antonina Vasilievna; Khanina, Maria Kronidovna; Tkachenko, Evgeny Alexandrovich; and Bashkirtsev, Vyacheslav Nikolaevich, 3,981,772.

Gaines, Donald R.; Smallegan, Jon M.; and Trudeau, William H., to Gulf & Western Manufacturing Company. Method and apparatus for assembly of bearing bushing. 3,981,065, Cl. 29-450.000.

Gall, James W., to Phillips Petroleum Company. Partially crosslinked polymer used in correcting subterranean formation permeability. 3,981,363, Cl. 166-270.000.

Gallagher, Bernard J.: *See—*
Callahan, Francis J., Jr.; Gallagher, Bernard J.; Matousek, Stephen; and Koch, Ulrich H., 3,981,482.

Gallo, Alfredo. Scrubber-sander with cleaner dispensing means. 3,981,106, Cl. 51-358.000.

Gallo, Stephen Robert: *See—*
Van Dam, Max; and Gallo, Stephen Robert, 3,981,733.

Galzy, Pierre; and Moulin, Guy Jean, to Agence Nationale de Valorisation de la Recherche (ANVAR). Process for the preparation of galactose and beverages based on galactose from solutions containing lactose. 3,981,773, Cl. 195-31.00R.

Gama, Mario. Mechanical device for astronomical calculation. 3,981,080, Cl. 33-1.0SC.

Gambill, Ulysses T.; and Brock, Gregory C., Jr., to Owens-Corning Fiberglas Corporation. Molding apparatus with supporting frame for preform stock material. 3,981,669, Cl. 425-397.000.

Gancy, Alan B.; and Wamser, Christian A., to Allied Chemical Corporation. Suppression of water pollution caused by solid wastes containing chromium compounds. 3,981,965, Cl. 423-55.000.

Gandilhon, Pierre: *See—*
Chabardes, Pierre; Gandilhon, Pierre; Grard, Charles; and Thiers, Michel, 3,981,900.

Gandini, Giovanni: *See—*
Kruger, Emilio; Ruffini, Guglielmo; Gandini, Giovanni; and Ghislandi, Franco, 3,981,765.

Gante, Joachim; Kurmeier, Hans-Adolf; Mehrhof, Werner; and Wild, Albrecht, to Merck Patent Gesellschaft mit beschrankter Haftung. Sulfoxides and sulfones. 3,981,887, Cl. 260-327.00P.

Ganz, Robert H., to Federal Paper Board Company, Inc. Bottle packaging machine. 3,981,120, Cl. 53-48.000.

Ganzler, Wolfgang; Kabs, Klaus; and Schroeder, Gunter, to Rohm GmbH. Preparation of glycol esters. 3,981,908, Cl. 260-497.00R.

Gardiner, Kenneth W.; and Schaefer, Louis F., to Savin Business Machines Corporation. Electrophotographic liquid developing system. 3,981,267, Cl. 118-7.000.

Garinger, Dale Albert: *See—*
Rao, Ganta Venkateswara; Garinger, Dale Albert; and Shoup, Floyd Kent, 3,981,738.

Garnett, John Lyndon: *See—*
Kenyon, Robert Sydney; Garnett, John Lyndon; and Liddy, Michael James, 3,981,775.

Garrett Corporation, The: *See—*
Demogenes, Christos; and Stone, Robert A., 3,981,448.

Gasc, Jean-Claude: *See—*
Chazan, Jean Bernard; Coussediere, Daniel; and Gasc, Jean-Claude, 3,981,861.

Gast Manufacturing Corporation: *See—*
Kemp, Donald P., 3,981,631.

Gates Rubber Company, The: *See—*
Richard, Byron G., 3,981,390.

Gebelius, Sven Runo Vilhelm. Pipe connecting device. 3,981,322, Cl. 137-318.000.

Gebr. Hofmann KG: *See—*
Himmler, Gunther, 3,981,174.

Gebruder Staiger, Fabrik fur Feinmechanik und Elektrotechnik — Kunststoffspritzerei: *See—*
Jackle, Reinhard, 3,981,139.

Gehrke, James Keith, to Motorola, Inc. Automatic gain control circuit for a crystal oscillator. 3,982,210, Cl. 331-109.000.

General Dynamics Corporation: *See—*
Poulsen, Peter D., 3,982,206.
Woods, Eric R.; and Thompson, Russell G., 3,982,067.

General Electric Company: *See—*
Abolins, Visvaldis; Cooper, Glenn D.; and Lee, Gim F., Jr., 3,981,841.
Anthony, Thomas R.; and Cline, Harvey E., 3,982,268.
Bittner, John R.; and Wesner, Ronald D., 3,981,383.
Bose, Bimal K.; and Espelage, Paul M., 3,982,168.
Buzzell, Colby E.; and Ziemba, Richard T., 3,981,245.
Cline, Harvey E.; and Anthony, Thomas R., 3,982,270.
Cook, Newell C.; and Davis, Gary C., 3,981,933.
Crivello, James V., 3,981,897.
Dills, Raymond L., 3,982,096.
Espelage, Paul M., 3,982,167.
Greenhalgh, Milton Sharples; and Lever, Ray Clarence, 3,981,653.
Hahn, Thomas M.; and Sholtes, George T., 3,981,456.
Ham, Donald M., 3,981,439.
Joynson, Reuben E.; and Mundy, Joseph L., 3,982,227.
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Porter, Joseph W., 3,982,088.
Schlereth, Fritz H., 3,982,112.
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Smith, William E., 3,981,931.
Soule, Hendrick H., Jr.; and Jureller, John F., 3,982,245.
Torreno, Manuel L., Jr.; Kurz, Bruno F., deceased; and Krishna, Surinder, 3,982,269.
Zlupko, John E., 3,982,048.

General Electric Company Limited, The: *See—*
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Barnaby, Bernard Sydney; and Scott, Donald Gordon, 3,982,065.

General Foods Corporation: *See—*
Bahoshy, Bernard J.; Klose, Robert E.; and Nordstrom, Harold A., 3,982,023.

General Motors Corporation: *See—*
Aluzzo, Peter J.; Gibson, Charles G.; and Olson, Albert T., 3,982,119.
Aspinwall, Robert H., 3,981,623.
Black, Dennis A.; and Brucken, Byron L., 3,981,157.
Bubniak, William C.; Klomp, Edward D.; Matthes, William R.; and Schilke, Neil A., 3,981,279.
Buckthorpe, George E., 3,981,697.
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Schlanzky, Manfred P. H., 3,982,225.

General Tire & Rubber Company, The: *See—*
Elmer, Otto C., 3,981,760.

Geometric Machine and Design Corporation: *See—*
Myer, William R., 3,981,509.

George, Kenyon Palmer, to Xerox Corporation. Optical absorption cell with magnetic stirring. 3,981,594, Cl. 356-246.000.

George, Richard Alexander; and van Abel, Adriaan Herman Hubert, to U.S. Philips Corporation. Method of automatically transferring and injecting a liquid sample. 3,981,200, Cl. 73-422.0GC.

Gerber Products Company: *See*—
Keim, Cameron D., 3,981,430.

Gerber Scientific Instrument Company, The: *See*—
Rich, Leonard G., 3,982,165.

Germain, Michel: *See*—
Bathellier, Andre; and Germain, Michel, 3,981,961.

Gersbach, John Edwin, to International Business Machines Corporation. Gate current source. 3,982,171, Cl. 323-1.000.

Ghilardi, Giuliana; Bore, Pierre; and Grollier, Jean-Francois, to L'Oreal. Lyophilized dyes and the use thereof to color keratinic fibers. 3,981,676, Cl. 8-10.000.

Ghilardi, Giuliana; Bore, Pierre; and Grollier, Jean-Francois, to L'Oreal. Lyophilized dyes and the use thereof to color keratinic fibers. 3,981,678, Cl. 8-11.000.

Ghislandi, Franco: *See*—
Kruger, Emilio; Ruffini, Guglielmo; Gandini, Giovanni; and Ghislandi, Franco, 3,981,765.

Giacino, Christopher: *See*—
Slangan, Gary; Pittet, Alan O.; Giacino, Christopher; Hruza, Denis E., Sr.; and Shuster, Edward J., 3,982,009.

Giannatto, Carl J.; and Watkin, Theodore, to United Technologies Corporation. Retractable radome. 3,982,250, Cl. 343-872.000.

Gibson, Charles G.: *See*—
Aluzzo, Peter J.; Gibson, Charles G.; and Olson, Albert T., 3,982,119.

Gievers, John G., to Chrysler Corporation. Monitoring relative displacement between two devices. 3,981,587, Cl. 356-152.000.

Gigliello, Joseph F., to Corning Glass Works. Apparatus for separating multiphase fluids. 3,981,804, Cl. 210-516.000.

Gilbert, G. S. Beckwith: *See*—
Herrmann, John R.; and Alexander, Robert L., 3,981,249.

Gilbert, Harold James; and McConnell, Edmund Alexander, to Wickman Machine Tool Sales Limited. Drive mechanisms for lathe spindles. 3,981,056, Cl. 29-38.00B.

Gilbert, Paul B., to Motorola, Inc. Combined dial scale and station indicator. 3,981,265, Cl. 116-124.400.

Gilberto, Paul, to USM Corporation. Exhaust muffler for pneumatic tool or machine. 3,981,377, Cl. 181-36.00A.

Gillery, Frank Howard, to PPG Industries, Inc. Solar heat collector. 3,981,293, Cl. 126-271.000.

Gillette, Roger B.: *See*—
Deminet, Czeslaw; and Gillette, Roger B., 3,981,294.

Giuliani, Robert L. Automatic bottom margin signal system for typewriters. 3,981,388, Cl. 197-189.000.

Givaudan Corporation: *See*—
Nikawitz, Edward J., 3,981,814.

Gladden, Ernest Laird, to Ensign-Bickford Company, The. Detonating cap assembly and connecting bushing. 3,981,240, Cl. 102-29.000.

Glanvall, Rune Valdemar; and Lundberg, Anders, to Stal-Refrigeration AB. Multistage vane type rotary compressor. 3,981,703, Cl. 62-509.000.

Glassford, John Gilmour: *See*—
Bingham, Henry; Glassford, John Gilmour; and Pope, Noel Cuthbert, 3,981,370.

Glaxo Laboratories Limited: *See*—
Phillipps, Gordon H.; Bain, Brian M.; and Clark, John C., 3,981,894.

Gleason Works, The: *See*—
Dixon, William F., 3,981,725.

Globe-Union Inc.: *See*—
Larson, Willis August, 3,981,757.

Gmerek, Jean-Daniel: *See*—
Scherrer, Claude-Jacques; Mauleon, Jean-Louis; and Gmerek, Jean-Daniel, 3,981,780.

Goble, Ralph W., to Sontrix, Inc. Piezoelectric transducer assembly and method for generating a cone shaped radiation pattern. 3,982,142, Cl. 310-8.200.

Godfried, Leo M., to Fokker-V.F.W. B.V. Fire-protecting epoxy resins. 3,981,832, Cl. 260-2.5EP.

Goeke, John C. Telescoping garment hanger. 3,981,404, Cl. 211-1.300.

Goell, James Emanuel; Li, Tingye; and Muska, Willis Martin, to Bell Telephone Laboratories, Incorporated. Optical fiber power taps. 3,982,123, Cl. 250-227.000.

Goerens, Robert L. Ear-shaped ring travelers for yarn twisters. 3,981,136, Cl. 57-125.000.

Goldman, Robert N., to Telecredit, Inc. Credit verification system. 3,982,103, Cl. 235-61.70B.

Goldschmidt, Arthur Marvin; Dischert, William Arnold; and West, Joseph Richard, to RCA Corporation. System for controlling tension of magnetic tape. 3,982,160, Cl. 318-7.000.

Goldstein, Thomas, to Bell Telephone Laboratories, Incorporated. Stabilization of laser output. 3,982,202, Cl. 331-94.50S.

Goloff, Alexander, to Caterpillar Tractor Co. Slant axis rotary mechanism. 3,981,640, Cl. 418-51.000.

Gonnella, Sebastian: *See*—
Kaplan, Richard B.; Gonnella, Sebastian; and Abrams, Walter M., 3,982,148.

Gonzalez, Octavio Raymundo: *See*—
Gonzalez, Ray; Gonzalez, Roy; and Gonzalez, Octavio Raymundo, 3,981,501.

Gonzalez, Ray; Gonzalez, Roy; and Gonzalez, Octavio Raymundo. Retractible goal post. 3,981,501, Cl. 273-55.00R.

Gonzalez, Roy: *See*—
Gonzalez, Ray; Gonzalez, Roy; and Gonzalez, Octavio Raymundo, 3,981,501.

Goodrich, William F.: *See*—
Flaherty, John W.; Ingersoll, Robert C.; and Goodrich, William F., 3,981,105.

Goodyear Tire & Rubber Company, The: *See*—
Bauer, John R.; and Forney, Joseph M., 3,981,341.
Johnson, Ernest D.; and Wright, Hugh W., 3,981,118.

Gorchev, Dimiter, to Mitco Corporation. Induction mixing nozzle. 3,981,326, Cl. 137-604.000.

Gordon, Alan Mayer: *See*—
Brown, Earl Franklin; Eilenberger, Robert Lewis; Gordon, Alan Mayer; Gordon, Pat Le Mar; and Limb, John Ormond, 3,982,063.

Gordon, Pat Le Mar: *See*—
Brown, Earl Franklin; Eilenberger, Robert Lewis; Gordon, Alan Mayer; Gordon, Pat Le Mar; and Limb, John Ormond, 3,982,063.

Gori-Vaerk A/S: *See*—
Ehrenskjold, Nils Oluf; and Munk, Torben, 3,981,613.

Gorog, Istvan: *See*—
Heyman, Philip Michael; Quinn, Robert Leon; and Gorog, Istvan, 3,981,560.

Goshima, Takeshi; and Endo, Kiyonobu, to Canon Kabushiki Kaisha. Optical system for obtaining linear image and recorded device utilizing the optical system. 3,982,253, Cl. 354-4.000.

Gospodar, Reinhard, to Volkswagenwerk Aktiengesellschaft. Carburetor. 3,981,284, Cl. 123-119.00A.

Gottschlich, James A., to NCR Corporation. Method for inking preassembled ribbon cartridges. 3,981,387, Cl. 197-168.000.

Gotzmer, Carl, Jr., to United States of America, Navy. Process for preparing high density solid propellants. 3,981,756, Cl. 149-19.300.

Gould Inc.: *See*—
Seider, Gene J.; and Freund, Michael C., 3,982,097.

Goulet, Roger T. Fluid pressure sensing apparatus. 3,981,193, Cl. 73-212.000.

Gowers, Jonathan Paul, to U.S. Philips Corporation. Photocathode manufacture. 3,981,755, Cl. 148-171.000.

Grabilin, Anatoly Mikhailovich: *See*—
Aimbinder, Mark Borisovich; Zhitomirsky, Mikhail Iosifovich; Denisova, Maria Vasilievna; Grabilin, Anatoly Mikhailovich; Lapushkin, Grigory Alexeevich; Kupershmidt, Moisei Zusievich; Mazov, Jury Alexeevich; Terentiev, Viktor Petrovich; Sergeev, Jury Vasilievich; and Muzylev, Vladimir Sergeevich, 3,981,130.

Grace, Michael H., to Allis-Chalmers Corporation. Time-ratio control having bidirectional speed potentiometer. 3,982,161, Cl. 318-257.000.

Graham, Robert P.: *See*—
Weaver, Merle L.; Huxsoll, Charles C.; and Graham, Robert P., 3,982,037.

Granetzke, Dennis C., to Modine Manufacturing Company. Heat exchanger. 3,981,356, Cl. 165-179.000.

Granger, Maurice; Lerond, Andre; and Failliot, Olivier. Apparatus for cutting sheet material. 3,981,215, Cl. 83-455.000.

Granges Engineering AB: *See*—
Erixson, John, 3,981,754.

Grant, Norman H.: *See*—
Alburn, Harvey E.; and Grant, Norman H., 3,981,915.

Graphic Arts Packaging Corporation: *See*—
Matsuyama, Glen, 3,981,431.

Grard, Charles: *See*—
Chabardes, Pierre; Gandilhon, Pierre; Grard, Charles; and Thiers, Michel, 3,981,900.

Greatbatch, Wilson; and Mead, Ralph T., to Wilson Greatbatch, Ltd. Enclosure for lithium-iodine cell and method of making the same. 3,981,744, Cl. 429-178.000.

Green, Norman, to Bendix Corporation, The. Digital frequency synthesizer. 3,982,199, Cl. 331-51.000.

Green, Philip S., to Stanford Research Institute. Composite acoustic lens. 3,982,223, Cl. 340-8.00L.

Greenhalgh, Milton Sharples; and Lever, Ray Clarence, to General Electric Company. Apparatus for the manufacture of an electrical conductor covered with a crosslink cured polymeric insulation. 3,981,653, Cl. 425-113.000.

Greenwood, Arthur R.; and Lemberger, Earl S., to Universal Oil Products Company. Regeneration method for gravity-flowing catalyst particles. 3,981,824, Cl. 252-415.000.

Greer, Norman L.: *See*—
Housholder, William R.; and Greer, Norman L., 3,982,134.

Griffin, Henry W., to General Motors Corporation. Window glass bonding strip. 3,981,113, Cl. 52-208.000.

Grise, Frederick G. J.: *See*—
Lovell, Walter C.; and Grise, Frederick G. J., 3,981,652.

Griswold, Augustus W.: *See*—
Smith, Richard E.; and Griswold, Augustus W., 3,981,272.

Gritter, David James; and Studtmann, George Henry, to Borg-Warner Corporation. Variable speed, constant frequency induction generator system. 3,982,170, Cl. 322-47.000.

Groch, Mark W.; and Whitehead, Frank R., to G. D. Searle & Co. Dual crystal scintillation probe. 3,982,128, Cl. 250-363.00S.

Grodzitsky, Stanislav Vitalievich: *See*—
Medovar, Boris Izrailevich; Saenko, Vladimir Yakovlevich; Schupak, Grigory Bentsionovich; Alferov, Jury Fedorovich; Karpov,

Vladimir Fedorovich; Berman, Kirill Adolfovich; Pogoretsky, Vitaly Vasilievich; Ovseichuk, Vitaly Alexandrovich; Zabolotsky, Petr Stepanovich; Boiko, Georgy Alexandrovich; Oleinik, Vladimir Ivanovich; Grodzitsky, Stanislav Vitalievich; Popov, Viktor Andreevich; and Chvertko, Anatoly Ivanovich, 3,981,349.

Grollier, Jean-Francois: *See—*
Ghilardi, Giuliana; Bore, Pierre; and Grollier, Jean-Francois, 3,981,676.
Ghilardi, Giuliana; Bore, Pierre; and Grollier, Jean-Francois, 3,981,678.

Grotnes Machine Works, Inc.: *See—*
Hess, Johann T.; and Kucklick, Frederick C., 3,981,172.

Groupe Europeen pour la Technique des Turbines a Vapeur G.E.T.T.: *See—*
Krol, Salomon, 3,981,615.

Grove Valve and Regulator Company: *See—*
Calvert, Martin A., 3,981,066.

Grumman Aerospace Corporation: *See—*
Nelson, George R., Jr., 3,981,618.

Grundy, Frederick Simm; and King, John Byron, to Pifco Limited. Beverage-making apparatus. 3,981,231, Cl. 99-280.000.

GTE Sylvania Incorporated: *See—*
Anderson, Richard W.; and Pettee, James L., 3,981,340.
Burdick, Glen Alden; and Zmuda, Edward Izydor, 3,982,153.
Monroe, Tex K., 3,982,156.

Gugel, John D., to PPG Industries, Inc. Glass-carbon reinforced foamed resin tennis racket frame. 3,981,504, Cl. 273-73.00F.

Guggenheim, Howard Joseph: *See—*
Bergman, John George, Jr.; Crane, Glen Robert; and Guggenheim, Howard Joseph, 3,982,136.

Gulf & Western Manufacturing Company: *See—*
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Jackson, William M.; and Peters, Edwin E., 3,981,061.

Gust, Raymond Edward; and Murphy, Patrick Henry. Beverage dispensing system. 3,981,414, Cl. 222-38.000.

Gustafsson, Nils Henry, to Swepall AB. Transport carriage. 3,981,510, Cl. 280-33.99H.

Gustavsson, Per-Olof Gerhard; and Morwing, Bo Anders, to Telefonaktiebolaget L M Ericsson. Device for transmission of information from an information emitter to an information seeker. 3,982,243, Cl. 343-6.50R.

Guthrie, James Leverette; and Kehr, Clifton Leroy, to W. R. Grace & Co. Novel urethane polythiols. 3,981,901, Cl. 260-468.00E.

Guthrie, James Leverette; and Kehr, Clifton Leroy, to W. R. Grace & Co. Novel urethane polythiols. 3,981,904, Cl. 260-471.00C.

Gutix S.A.: *See—*
Alsina, D. Luis Gutierrez, 3,982,030.

Gutman, Arnold D., to Stauffer Chemical Company. Process for control of sheep maggot fly. 3,981,995, Cl. 424-219.000.

Gutner, Kenneth H. Drawer slide. 3,981,553, Cl. 312-347.000.

Gutridge, Jack E.; and Schuller, James J., to Pullman Incorporated. Anti-pilferage lock for box car doors. 3,981,524, Cl. 292-31.000.

Guttropf, Walter: *See—*
Andorf, Paul; Franz, Dietmar; Lieb, Alfred; Upper, Gerd; and Guttropf, Walter, 3,981,528.

Guymer, Jon Anthony, to Mobil Oil Corporation. Prediction of engine failure by examination of particle size distribution of metal particles in lubricant. 3,981,584, Cl. 356-70.000.

Guyot, Lucien: *See—*
Charles, Daniel; Guyot, Lucien; Reboul, Jean Philippe; and Moiroud, Guy, 3,982,068.

Guzzi, Anthony, to G & S Metal Products Inc. Window construction. 3,981,101, Cl. 49-162.000.

Gyromat Corporation, The: *See—*
Wiggins, Richard F., 3,981,320.

H. A. Schlatter AG: *See—*
Zollinger, Hans R., 3,982,091.

H. & D. E. Watts Limited: *See—*
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H.W. Andersen Products Inc.: *See—*
Andersen, Harold Willids; and Harrison, Charles H., 3,981,701.

Haberski, Richard J., to Curtiss-Wright Corporation. Built-up tube and tubesheet assembly for multi-conduit heat exchangers. 3,981,354, Cl. 165-79.000.

Habr, Karel: *See—*
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Habu, Teiji; Yamaguchi, Hisashi; Wada, Tsuneo; Sasaki, Takashi; Ishii, Hiroki; Omura, Takayoshi; and Inokuma, Hiroyuki, to Konishiroku Photo Industry Co., Ltd. Gelatin hardening process. 3,981,857, Cl. 260-117.000.

Hadden, Edward Leal: *See—*
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Hafner, Otto P. Method and apparatus for interlocking overlapping sheet material. 3,981,064, Cl. 29-432.000.

Hagerty, Philip J.: *See—*
Tomecek, Jerry J.; and Hagerty, Philip J., 3,981,544.

Haggkvist, Bjorn. Bicycle and tricycle of low wind resistance and of low center of gravity. 3,981,516, Cl. 280-263.000.

Hahn, Thomas M.; and Sholtes, George T., to General Electric Company. Food particle macerating means. 3,981,456, Cl. 241-46.00R.

Haines, Donald John. Method for casting blocks having fractured face. 3,981,953, Cl. 264-163.000.

Halasz, Alexander; Brody, Frederick, deceased; and by Newman, Richard, executor, to Clairol Incorporated. Oxidative hair dye compositions containing N-substituted o-phenylenediamines and method for their use. 3,981,677, Cl. 8-10.200.

Halkola, John T.: *See—*
Prior, Barry W.; and Halkola, John T., 3,981,451.

Hall, Charles M., to Upjohn Company, The. m-Phenylene dioxamic acid derivatives. 3,982,006, Cl. 424-267.000.

Hall, John B., to International Flavors & Fragrances Inc. Diels-Alder adduct product. 3,981,924, Cl. 260-598.000.

Hall, Richard W.; and Sonnenberg, Sven, to Kelsey-Hayes Company. Hydraulic intensifier control system. 3,981,622, Cl. 417-46.000.

Hall Ski-Lift Company, Inc.: *See—*
Savage, Phillip D., 3,981,248.

Haller, Pierre, to Kraftwerk Union Aktiengesellschaft. Neutron detector cable monitoring. 3,982,131, Cl. 250-390.000.

Halliburton Company: *See—*
Barrington, Burchus Q.; Farley, David L.; and Morrisett, O. L., 3,981,188.

Hallmann, David R. X-ray table patient transfer device or the like with body holding device. 3,981,492, Cl. 269-328.000.

Ham, Donald M., to General Electric Company. Unidirectional drive assembly for a gear driven meter register. 3,981,439, Cl. 235-91.00R.

Hamada, Masato: *See—*
Fukuoka, Yohei; Kato, Toshio; Imai, Norio; Nishikido, Joji; Hamada, Masato; Mikami, Hiroshi; Iwasaki, Hirohumi; and Koike, Toshihisa, 3,981,906.

Hamilton, Thomas N.: *See—*
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Hammann, Ingeborg: *See—*
Hoffmann, Hellmut; Hammann, Ingeborg; and Stendel, Wilhelm, 3,981,994.
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 3,981,993.

Hammond, Ogden H., III; and Baratta, Francis I., to Massachusetts Institute of Technology. Method of and apparatus for nondestructively determining the composition of an unknown material sample. 3,981,175, Cl. 73-15.00R.

Hanak, Fredric M.: *See—*
Steele, John M.; Hanak, Fredric M.; Nino, Guillermo J.; and Panzarella, John E., 3,981,938.

Handa, Kenichi: *See—*
Okada, Ryuzo; Nagashima, Toshio; Kito, Hidetoshi; Tsukamoto, Takuzo; Nakaguchi, Michiharu; and Handa, Kenichi, 3,981,271.

Handler, Klaus: *See—*
Bielfeldt, Friedrich Bernd; and Handler, Klaus, 3,981,662.

Harada, Noboru, to Mitsubishi Heavy Industries, Inc. Protection apparatus for remotely controlled self-reversing marine engines. 3,981,278, Cl. 123-41.00R.

Hard Metals Limited: *See—*
Bingham, Henry; Glassford, John Gilmour; and Pope, Noel Cuthbert, 3,981,370.

Hardtmann, Goetz E., to Sandoz, Inc. Alkyl-substituted-tricyclic quinazolinones as bronchodilators. 3,982,000, Cl. 424-251.000.

Harkness, Joseph R., to Briggs & Stratton Corporation. Automatic compression relief mechanism for internal combustion engines. 3,981,289, Cl. 123-182.000.

Harper, John W.: *See—*
Kay, Thomas D.; and Harper, John W., 3,982,132.

Harper, William H., Jr. Catamaran with extensible hulls. 3,981,259, Cl. 114-61.000.

Harrington, Joseph Kenneth: *See—*
Mutsch, Edward L.; and Harrington, Joseph Kenneth, 3,981,914.

Harris, Gary R.: *See—*
Pace, Gerald F.; Stauter, John C.; Armstrong, Calvin N.; and Harris, Gary R., 3,981,784.

Harrison, Charles H.: *See—*
Andersen, Harold Willids; and Harrison, Charles H., 3,981,701.

Harrison, Charles W.; Pitman, Herbert J.; and Senters, Glenn A., to Texaco Inc. Apparatus for oil dewaxing. 3,981,789, Cl. 204-272.000.

Harshaw Chemical Company, The: *See—*
Richardson, John G., 3,981,973.
Swinehart, Carl F.; and Sfiligoj, Marko, 3,981,818.

Hart, Cornelis Maria: *See—*
Janssen, Daniel Johannes Gerardus; and Hart, Cornelis Maria, 3,982,078.

Hartig, Wolfgang; Berges, Dietrich; and Schippers, Heinz, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. High speed twisting machine. 3,981,131, Cl. 57-58.540.

Hartmann, Werner; Queisser, Hans-Joachim; Markewitz, Gregor; Rettenmaier, Ulli; Sprater, Gunter; and Kniep, Rudiger, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Method and apparatus for displaying the internal structure of an object. 3,982,127, Cl. 250-273.000.

Hartung, Kuhn & Co. Maschinenfabrik GmbH: *See—*
Schulte, Fritz; Riecker, Johann G.; and Bender, Martin, 3,981,778.

Harwood, Frank Stuart; and Dorst, Heinz Otto, to Dover Corporation. Warp resistant fire door. 3,981,102, Cl. 49-501.000.

Hashimoto, Shoji: *See—*
Taniguchi, Masao; Machi, Sueo; Kawakami, Waichiro; Hashimoto, Shoji; Kawamura, Keita; and Aoki, Shingi, 3,981,815.

Hashimoto, Yukio; and Sunada, Fumiyuki, to Fuji Oil Company, Ltd. Soy cheese spread and process for preparing same. 3,982,025, Cl. 426-46.000.

Haskett, Philip R.: *See—*
Smyres, Gary A.; Haskett, Philip R.; Scheiner, Bernard J.; and Lindstrom, Roald E., 3,981,962.

Hattori, Saburo; Morita, Yoshiharu; Ihashi, Yoshio; and Sato, Tadao, to Mitsubishi Chemical Industries Ltd. Method of producing highly unsaturated compounds by reacting 1,3-conjugated diene compounds with derivatives of dimers of butadienes and products. 3,981,907, Cl. 260-488.00H.

Hauck, Frederic P.; Cimarusti, Christopher M.; and Narayanan, Venkatachala L., to E. R. Squibb & Sons, Inc. Compositions for the treatment of coronary diseases containing tetrahydronaphthyloxy-aminopropanols. 3,982,021, Cl. 424-330.000.

Haus, Ralph A.: *See—*
Abell, William A., Jr.; Field, Thomas R.; Haus, Ralph A.; and Shakib, Iraj D., 3,981,386.

Hawkes, Ivor, to Creare, Incorporated. Rock breaking apparatus. 3,981,540, Cl. 299-62.000.

Hayashi, Takashi: *See—*
Takeuchi, Yasumasa; Ikeda, Takehiko; Sekimoto, Akira; Hayashi, Takashi; Sasaki, Toshimi; and Atsumi, Sabulo, 3,981,830.

Hayes, Douglas R.; and Phipps, Charles M., to United Technologies Corporation. Investment casting mold and process. 3,981,344, Cl. 164-26.000.

Hayes, Douglas R.; and Perron, James S., to United Technologies Corporation. Method and apparatus for directional solidification. 3,981,346, Cl. 164-60.000.

Hazen, George G.: *See—*
Russ, Warren K., Jr.; Hazen, George G.; and Chamberlin, Earl M., 3,981,888.
Sletzinger, Meyer; and Hazen, George G., 3,981,911.

Healy, Robert N., to Exxon Production Research Company. Oil recovery method using microemulsions. 3,981,361, Cl. 166-252.000.

Hedlund, Junior M., to Hedlund Manufacturing Co., Inc. Material handling system. 3,981,635, Cl. 417-551.000.

Hedlund Manufacturing Co., Inc.: *See—*
Hedlund, Junior M., 3,981,635.

Heffe, Wilhelm; Hunziker, Fritz; and Thoma, Klaus, to Sandoz, Inc. 4-(3.4-Methylene dioxy phenyl)-piperidines. 3,982,001, Cl. 424-267.000.

Hehr International Inc.: *See—*
Oiler, Philip R., 3,981,067.

Heimes, Willy, to Palitex Project-Company G.m.b.H. Yarn guide eyelet and monitoring mechanism in a textile yarn processing machine. 3,981,134, Cl. 57-81.000.

Heinz, David M.: *See—*
Mee, Jack E.; Hamilton, Thomas N.; Archer, John L.; and Heinz, David M., 3,982,049.

Heinzer, Paul, to Wifo Wissenschaftliches Forschungs-Institut A.G. Electrophotographic copying machine with seamless image forming and transfer band. 3,981,578, Cl. 355-16.000.

Helmer, Josef, to Daimler-Benz Aktiengesellschaft. Pump wheel for a hydrodynamic unit. 3,981,614, Cl. 416-180.000.

Hemfort, Heinrich; Pautsch, Gunthard; and Kohlstette, Werner, to Westfalia Separator AG. Centrifuge having a system for controlling the temperature of the liquid to be centrifuged or of one of the components thereof. 3,981,437, Cl. 233-11.000.

Henderson, Cyril; and Close, Albert R., to American Safety Equipment Corporation. Single retractor continuous loop restraint system. 3,981,535, Cl. 297-389.000.

Henderson, James G.: *See—*
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Henderson, James M.: *See—*
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Hengst, Bruno: *See—*
Buddenberg, Adolf; Hengst, Bruno; and Weskamp, Josef, 3,981,651.

Henin, Jean Pierre: *See—*
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Henrick, Clive A., to Zoecon Corporation. Di-olefinic ketones. 3,981,922, Cl. 260-593.00R.

Henrion, W. S., to Texas Instruments Incorporated. Thermal printhead with drivers. 3,982,093, Cl. 219-216.000.

Henry, Charles Howard: *See—*
Dingle, Raymond; and Henry, Charles Howard, 3,982,207.

Henry, Raymond, to Thomson-CSF. Pin diode with a thick intrinsic zone and a device comprising such a diode. 3,982,267, Cl. 357-52.000.

Henry, Raymond W.: *See—*
Burkett, Bobby G.; and Henry, Raymond W., 3,982,230.

Herrin, Thomas Raymond: *See—*
Oslapas, Raymond; and Herrin, Thomas Raymond, 3,981,982.

Herrle, Karl: *See—*
Linke, Wolfgang; Herrle, Karl; Schwarz, Wolfgang; and Perner, Johannes, 3,981,987.

Herrmann, John R.; and Alexander, Robert L., to Gilbert, G. S. Beckwith. Load bearing pallet. 3,981,249, Cl. 108-52.100.

Hervert, George L., to Universal Oil Products Company. Monolithic honeycomb form electric heating device. 3,982,100, Cl. 219-553.000.

Herzner, Hans. Displaced piston machine. 3,981,645, Cl. 418-161.000.

Hess, Johann T.; and Kucklick, Frederick C., to Grotnes Machine Works, Inc. Method and apparatus for expanding spirally welded pipe. 3,981,172, Cl. 72-370.000.

Heyman, Philip Michael; Quinn, Robert Leon; and Gorog, Istvan, to RCA Corporation. Electrochromic display device. 3,981,560, Cl. 350-160.00R.

Hicks, Alton D.: *See—*
Pangle, James C., Jr.; and Hicks, Alton D., 3,981,836.

Higgs, William York, to Intercontinental Marine Limited. Life saving buoy for small vessels. 3,981,036, Cl. 9-9.000.

Hight, Paul H.: *See—*
Eldridge, Harry H.; Jones, Robert A.; Lindner, Gordon M.; and Hight, Paul H., 3,981,406.

Higuchi, Takeru; Hussain, Anwar A.; and Shell, John W., to Alza Corporation. Bioerodible ocular device. 3,981,303, Cl. 128-260.000.

Higuchi, Takeshi: *See—*
Nakayama, Shozo; Toriyama, Takeshi; and Higuchi, Takeshi, 3,981,629.

Hilbig, Jack H., to Rohr Industries, Inc. Roller lip seal for surface effect ships. 3,981,260, Cl. 114-67.00R.

Hilfman, Lee, to UOP Inc. Desulfurization of black oil utilizing a pretreated cobalt-molybdenum catalyst. 3,981,796, Cl. 208-215.000.

Hill, Charles E.: *See—*
Armbrust, William D.; Shallenberger, Dennis J.; and Hill, Charles E., 3,981,477.

Hill, Clifford B.: *See—*
Brooks, William O.; and Hill, Clifford B., 3,982,189.

Hill, Donald Gifford; and Lewis, Theras Gordon, to Bell Telephone Laboratories, Incorporated. Network control circuit for a time division switching system. 3,982,076, Cl. 179-15.0AT.

Hill, Frank E.: *See—*
Fogelberg, Mark J.; and Hill, Frank E., 3,981,146.

Hill, Robert D., to United States of America, Navy. Magnetic and electric field shielding of computer components from lightning. 3,982,058, Cl. 174-2.000.

Hill, William Frank, to Lucas Electrical Company Limited, The. Temperature sensitive electronic switching arrangements. 3,982,163, Cl. 318-473.000.

Hilti Aktiengesellschaft: *See—*
Maier, Elmar, 3,981,424.

Himmler, Gunther, to Gebr. Hofmann KG. Method of and device for testing the shock absorbers of a vehicle. 3,981,174, Cl. 73-11.000.

Hirano, Masachika; Ohno, Isao; Okuno, Yoshitoshi; Magara, Osamu; Itaya, Nobushige; Nishioka, Toshio; Mizutani, Toshio; Ohno, Nobuo; Matsuo, Takashi; and Takeda, Hisami, to Sumitomo Chemical Company, Limited. Cyclopropane carboxylic acid esters. 3,981,903, Cl. 260-468.00H.

Hishinuma, Yukio; and Tamura, Zensuke, to Hitachi, Ltd. Method for desulfurizing flue gas by active carbon suspension. 3,981,972, Cl. 423-244.000.

Hitachi, Ltd.: *See—*
Hishinuma, Yukio; and Tamura, Zensuke, 3,981,972.
Ito, Kazuhiro; Kawamura, Masao; Ono, Yuichi; and Morioka, Makoto, 3,981,764.
Yamazaki, Eiichi; Maruyama, Koichi; Ueda, Toshio; Yokomizo, Hiroshi; and Ogura, Iwao, 3,982,252.

Hitco: *See—*
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Hitzman, Donald O., to Phillips Petroleum Company. Fermentation of oxygenated hydrocarbon compounds with thermophilic microorganisms. 3,981,774, Cl. 195-49.000.

Hix, Charles M., Jr., to Arcadia Refining Company. System for recovering petroleum fluids from underwater fissures. 3,981,154, Cl. 61-101.000.

Hiyama, Yutaka: *See—*
Sato, Seiko; Hiyama, Yutaka; and Yokota, Mitsuhisa, 3,981,608.

Hoag, Ethan D.; and Pease, Henry E., to Avco Everett Research Laboratory, Inc. Electron beam gas discharge laser pressure control. 3,982,200, Cl. 331-94.50P.

Hobbs, James W.: *See—*
Christie, David A.; and Hobbs, James W., 3,981,793.

Hochberg, Frederick, to International Business Machines Corporation. Method and apparatus for recording information on a recording medium. 3,982,251, Cl. 346-1.000.

Hockele, Gunter: *See—*
Maiwald, Heinz; Hockele, Gunter; and Sauer, Hermann, 3,981,967.

Hocking, Thomas A., to International Harvester Company. Safety support for harvester combine feeders. 3,981,126, Cl. 56-15.900.

Hocking, Thomas A.: *See—*
Kerber, Dathan R.; Hocking, Thomas A.; and Vande Wiele, Jo'n L., 3,981,125.

Hodson, Kevin: *See—*
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Hoeberechts, Arthur Marie Eugene: *See—*
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Hoechst Aktiengesellschaft: *See—*
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Hoefke, Wolfgang: *See—*
Losel, Walter; Traunecker, Werner; and Hoefke, Wolfgang, 3,981,992.

Hoeflinger, Irene Burns; and Cohen, Diana. Carrel apparatus for use in learning. 3,981,086, Cl. 35-60.000.

Hoehn, Steven Jon; and Jackson, Joseph Monroe, to Litton Business Telephone Systems, Inc. Touch-to-rotary converter for a telephone instrument. 3,982,079, Cl. 179-81.00R.

Hoffmann, Hellmut; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. O-Alkyl-O-[1-phenyl-5-cyanoalkylmercapto-1,2,4-triazol(3)yl]-thionophosphoric(phosphonic) acid esters. 3,981,994, Cl. 424-200.000.

Hoffmann-La Roche Inc.: *See—*
Boller, Arthur; and Scherrer, Hanspeter, 3,981,817.
Pauling, Horst, 3,981,896.
Szkrybalo, William, 3,981,860.

Hofmann, Eberhard: *See—*
Staudt, Heinrich; and Hofmann, Eberhard, 3,981,634.

Hofstetter, Robert A. Safety can opener. 3,981,411, Cl. 220-267.000.

Hogan, Edward Merrick: *See—*
Fowler, John Rayford; and Hogan, Edward Merrick, 3,981,415.

Hogg, Walter R., to Coulter Electronics, Inc. Conductivity cell for particle study device. 3,982,182, Cl. 324-71.0CP.

Hokky, Stephen G., to Airborne Manufacturing Company. Fluid cooled commutated electric motor. 3,982,146, Cl. 310-89.000.

Holan, Leif A. Stand. 3,981,468, Cl. 248-167.000.

Holder, Charles Delbert, Jr., to International Paper Company. Method for improving the printability characteristics of gloss calendered paper. 3,982,056, Cl. 427-361.000.

Holland, William P.; and Merritt, William H., to Machlett Laboratories, Incorporated, The. Flexible cable termination. 3,982,059, Cl. 174-73.00R.

Holt, Corbly LeRoy, to Brady Air Controls, Inc. Cycling air volume control. 3,981,319, Cl. 137-211.000.

Home Curtain Corporation: *See—*
Taylor, Hervey, 3,981,255.

Homeyer, Bernhard: *See—*
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 3,981,993.

Honeywell Inc.: *See—*
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Hook, William R., to TRW Inc. Signal processing system. 3,982,114, Cl. 235-181.000.

Hool, Gerhard; and Kundig, Hans, to Ciba-Geigy Corporation. Synergistic composition for the control of bacteria. 3,982,022, Cl. 424-341.000.

Hoos, Gerald. Lens selector. 3,981,564, Cl. 350-255.000.

Hopper, William H. L., to Kennecott Copper Corporation. Stop-weld composition and the method of using it. 3,981,753, Cl. 148-23.000.

Horbach, Stephen. Molding apparatus selectively operable for either injection or transfer molding. 3,981,655, Cl. 425-181.000.

Horiuchi, Fukashi: *See—*
Umemura, Takeaki; and Horiuchi, Fukashi, 3,981,919.

Horn Construction Co., Inc.: *See—*
Potter, Stannard M., 3,981,378.

Horsley, James Othel, to RCA Corporation. High-speed counter with reliable count extraction system. 3,982,108, Cl. 235-92.0EA.

Hosogai, Takeo: *See—*
Nishida, Takashi; Ninagawa, Yoichi; Omura, Yoshiaki; Mori, Fumio; Tamai, Yoshin; Hosogai, Takeo; Fujita, Yoshiji; and Itoi, Kazuo, 3,981,930.

Hostetter, Richard S., Jr.: *See—*
Kranenberg, Helmut; and Hostetter, Richard S., Jr., 3,981,752.

Houlihan, William J.; and Manning, Robert E., to Sandoz, Inc. Substituted benzylidene hydrazines for treating hyperglycemia, obesity and inflammation. 3,982,020, Cl. 424-326.000.

Houlihan, William J.: *See—*
Cooke, George A.; and Houlihan, William J., 3,981,890.

Housholder, William R.; and Greer, Norman L. Shipping container for nuclear fuels. 3,982,134, Cl. 250-506.000.

Hovey, Emerson B.: *See—*
Davis, Howard G.; Hovey, Emerson B.; and Sylvester, Edwin E., 3,981,762.

Howard, Addison M., to Eltra Corporation. Method for zincating aluminum articles. 3,982,055, Cl. 427-309.000.

Howard, Curtis E.; and Calvin, Douglas G., to Texaco Inc. Methods and steam samplers with inertial latch. 3,981,189, Cl. 73-155.000.

Howard, David F.: *See—*
McCardle, Arthur, Jr.; Israel, George H., Jr.; Trombetta, Frank J.; and Howard, David F., 3,981,450.

Howell, Eddie P., to Atlantic Richfield Company. Method for measuring the thermal conductivity of well casing and the like. 3,981,187, Cl. 73-154.000.

Howmet Corporation: *See—*
Nurminen, John I.; and Sturgis, David H., 3,981,352.

Hoyer, Peter. Mounting facia plates on building structures. 3,981,115, Cl. 52-235.000.

Hozumi, Yukio: *See—*
Yoshizaki, Hiroyuki; Takanohashi, Hiromitsu; Masuda, Yoshitaka; Hozumi, Yukio; Ohi, Akira; and Sonoyama, Yuzo, 3,981,843.

Hruza, Denis E., Sr.: *See—*
Slangan, Gary; Pittet, Alan O.; Giacino, Christopher; Hruza, Denis E., Sr.; and Shuster, Edward J., 3,982,009.

Hsieh, Paul Y.: *See—*
Oh, Chan Soo; and Hsieh, Paul Y., 3,981,558.

Huber, Wolfgang; and Schrecke, Horst G., to SKF Industrial Trading and Development Company, B.V. Spinning ring supported by a slider bearing. 3,981,135, Cl. 57-124.000.

Hudgin, Donald E.; and Zawadzki, Thomas, to Princeton Polymer Laboratories, Incorporated. Degradable hydrocarbon polymers containing a metal compound and a benzotriazole. 3,981,856, Cl. 526-4.000.

Hudson, James M.: *See—*
Niswender, Gordon Dean; and Hudson, James M., 3,981,863.

Hughes Aircraft Company: *See—*
Berry, Clyde Raymond; and Cinzori, Robert J., 3,982,173.
Burns, Richard W., 3,982,214.
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Huille, Michel Ernest Antoine: *See—*
Cabut, Louis Antoine; and Huille, Michel Ernest Antoine, 3,981,734.

Hujer, Friedrich: *See—*
Weinert, Volker; Hujer, Friedrich; and Knapp, Walter, 3,981,579.

Hull, George Scott; Chaney, Louie V.; and Watson, Richard Dean, to Johnson Sheet Metal Works Corporation. Burial casket with improved sealing system. 3,981,054, Cl. 27-17.000.

Hultgren, Lars Evert; and Engwall, Olof, to Thermospray AG. Method and means for air purification during spray-painting. 3,981,694, Cl. 55-90.000.

Hunter, Edwin J., to Toro Company, The. Water operated control apparatus and method. 3,981,446, Cl. 239-1.000.

Hunziker, Fritz: *See—*
Heffe, Wilhelm; Hunziker, Fritz; and Thoma, Klaus, 3,982,001.

Husemann, Hinrich: *See—*
Bohmholdt, Gerd; Husemann, Hinrich; and Riedel, Helmut, 3,981,921.

Hussain, Anwar A.: *See—*
Higuchi, Takeru; Hussain, Anwar A.; and Shell, John W., 3,981,303.

Hutchins, Burleigh M., Jr.: *See—*
Abrahams, Louis; Hutchins, Burleigh M., Jr.; and Waters, James L., 3,981,620.

Hutchinson, James David: *See—*
Berlyn, Robin Wilfrid; and Hutchinson, James David, 3,981,453.

Hutterer, Johann, to Williams, David Godfrey, a part interest. Rotary piston machine. 3,981,638, Cl. 418-34.000.

Huxsoll, Charles C.: *See—*
Weaver, Merle L.; Huxsoll, Charles C.; and Graham, Robert P., 3,982,037.

Hwang, Sang-Hak: *See—*
Contractor, Rashmikant M.; and Hwang, Sang-Hak, 3,981,047.

Hyltin, Tom M., to Seiko Instruments Incorporated. Pushbutton switch. 3,982,089, Cl. 200-159.00B.

IBM: *See—*
Romankiw, Lubomyr T., 3,981,844.

ICI United States Inc.: *See—*
Markiewitz, Kenneth H., 3,981,913.

Ignatiev, Vladimir Vasilievich: *See—*
Berezhnoi, Igor Alexandrovich; Elatontsev, Albert Ivanovich; Ignatiev, Vladimir Vasilievich; Ivlev, Djuis Danilovich; Mayanov, Boris Veniaminovich; Svinukhov, Vasily Andriyanovich; Kuzmin, Vladimir Petrovich; Evdokimov, Igor Alexandrovich; and Zhidkov, Boris Alexeevich, deceased, 3,981,462.

Ihashi, Yoshio: *See—*
Hattori, Saburo; Morita, Yoshiharu; Ihashi, Yoshio; and Sato, Tadao, 3,981,907.

Iino, Hirokazu. Fibrous cleaning materials impregnated with a latex-mixture. 3,981,741, Cl. 134-6.000.

Ikeda, Hisao: *See—*
Murata, Minoru; Sugiyama, Koichi; and Ikeda, Hisao, 3,981,735.

Ikeda, Takehiko: *See—*
Takeuchi, Yasumasa; Ikeda, Takehiko; Sekimoto, Akira; Hayashi, Takashi; Sasaki, Toshimi; and Atsumi, Sabulo, 3,981,830.

Ilfrey, William T.: *See—*
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Illinois Tool Works Inc.: *See—*
Barth, Gerald Dean; and Wagner, David Prugh, 3,981,170.
Braden, Denver, 3,982,047.
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Imada, Setsuo: *See—*
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Imai, Mitsuo: *See—*
Nakashima, Kunihiko; Muroi, Ryoichi; Imai, Mitsuo; and Sato, Kenji, 3,981,958.

Imai, Norio: *See—*
Fukuoka, Yohei; Kato, Toshio; Imai, Norio; Nishikido, Joji; Hamada, Masato; Mikami, Hiroshi; Iwasaki, Hirohumi; and Koike, Toshihisa, 3,981,906.

Imperial Chemical Industries Limited: *See—*
Asher, Brian Roy; and Thompson, Morice William, 3,981,839.
Attwood, Terence Edwin; and Farrant, Barry William, 3,981,945.
Bellingham, Francis, 3,982,028.
Ryan, James Ernest; and Smale, Rodney, 3,981,949.

Incotex, S.A.: *See—*
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Ingersoll, Robert C.: *See—*
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Inokuma, Hiroyuki: *See—*
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Inoue, Masakazu: *See—*
Okamoto, Takehiko; Kishimoto, Akihiko; Nagai, Ikuo; Sato, Hiroshi; Okasaka, Hotsuma; and Inoue, Masakazu, 3,981,944.
Inoue, Shozo, to Canon Kabushiki Kaisha. Multicolor electrophotographic copier with liquid developing. 3,981,576, Cl. 355-4.000.
Institut de Recherches de la Siderurgie Francaise (IRSID): *See—*
Alberny, Robert; Leclercq, Alain; and Birat, Jean-Pierre, 3,981,345.
Interconsal Associates, Inc.: *See—*
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Intercontinental Marine Limited: *See—*
Higgs, William York, 3,981,036.
Intermountain Research and Development Corporation: *See—*
Lobunez, Walter; Kim, Nam Kyun; and Rau, Eric, 3,981,686.
International Basic Economy Corporation: *See—*
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International Business Machines Corporation: *See—*
Abell, William A., Jr.; Field, Thomas R.; Haus, Ralph A.; and Shakib, Iraj D., 3,981,386.
Bernstein, William A.; and Doggett, Robert H., 3,982,231.
Feinstein, Paul, Jr.; and Sokol, Gary Leo, 3,981,497.
Gersbach, John Edwin, 3,982,171.
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International Environmental Dynamics, Inc.: *See—*
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International Flavors & Fragrances Inc.: *See—*
Evers, William J.; Pelse, Igor A.; and Vock, Manfred Hugo, 3,982,038.
Hall, John B., 3,981,924.
Slangan, Gary; Pittet, Alan O.; Giacino, Christopher; Hruza, Denis E., Sr.; and Shuster, Edward J., 3,982,009.
Wilson, Richard Arnold; Katz, Ira; Vock, Manfred H.; and Shuster, Edward J., 3,982,034.
International Harvester Company: *See—*
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Kerber, Dathan R.; Hocking, Thomas A.; and Vande Wiele, John L., 3,981,125.
Phillips, Carmen S.; and Mecklin, Charles D., 3,981,391.
International Paper Company: *See—*
Holder, Charles Delbert, Jr., 3,982,056.
International Playtex, Inc.: *See—*
Donaghy, James G., 3,981,310.
International Telephone and Telegraph Corporation: *See—*
Clark, James Monroe, 3,982,074.
Clark, James Monroe; Cohen, Stuart Barry; and Magnus, Arthur Howard, 3,982,077.
Moore, John R., 3,981,422.
Richardson, Alexander Laidlaw, 3,981,440.
Slathar, Donald A.; and Neutkens, Christiaan H., 3,981,394.
Inventronics, Inc.: *See—*
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Irvine, Gerald O., to Scorpion, Inc. Unitary frame and engine support for snowmobile. 3,981,373, Cl. 180-5.00R.
Irwin, John A., to General Motors Corporation. Ceramic combustion liner. 3,981,142, Cl. 60-39.650.
Isenson, Raymond S.: *See—*
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Ishii, Hiroki: *See—*
Habu, Teiji; Yamaguchi, Hisashi; Wada, Tsuneo; Sasaki, Takashi; Ishii, Hiroki; Omura, Takayoshi; and Inokuma, Hiroyuki, 3,981,857.
Ishii, Yoshio: *See—*
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Ishikawa, Masakazu: *See—*
Ban, Masashi; Ishikawa, Masakazu; and Uemura, Hiroshi, 3,981,147.
Ishitani, Akiyasu, to Sony Corporation. Junction gated field effect transistor. 3,982,264, Cl. 357-22.000.
Islas, John J., to Victor Comptometer Corporation. Compound bow. 3,981,290, Cl. 124-24.00R.
Isogai, Nobuo; Okawa, Takashi; and Takeda, Takako, to Mitsubishi Gas Chemical Company, Inc. Process for producing per-p-toluic acid and utilizing the same. 3,981,909, Cl. 260-502.00A.
Israel, George H., Jr.: *See—*
McCardle, Arthur, Jr.; Israel, George H., Jr.; Trombetta, Frank J.; and Howard, David F., 3,981,450.
Itaya, Nobushige: *See—*
Hirano, Masachika; Ohno, Isao; Okuno, Yoshitoshi; Magara, Osamu; Itaya, Nobushige; Nishioka, Toshio; Mizutani, Toshio; Ohno, Nobuo; Matsuo, Takashi; and Takeda, Hisami, 3,981,903.
Ito, Kazuhiro; Kawamura, Masao; Ono, Yuichi; and Morioka, Makoto, to Hitachi, Ltd. III-V Compound semi-conductor crystal growth from a liquid phase on a substract including filtering liquid phase. 3,981,764, Cl. 156-622.000.
Ito, Tadashi; Nakamoto, Soichi; and Yamada, Sadao, to Canon Kabushiki Kaisha; and Tokyo Shibaura Electric Co., Ltd. Digital indication system for a camera. 3,982,254, Cl. 354-53.000.
Ito, Tateo: *See—*
Saito, Masumi; Tani, Sumio; Ito, Tateo; and Kasaoka, Shigeaki, 3,981,971.
Itoh, Tsuneyoshi: *See—*
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Itoi, Kazuo: *See—*
Nishida, Takashi; Ninagawa, Yoichi; Omura, Yoshiaki; Mori, Fumio; Tamai, Yoshin; Hosogai, Takeo; Fujita, Yoshiji; and Itoi, Kazuo, 3,981,930.
Ivey, John Saxon; and Braybrook, Kenneth Albert, to Borg-Warner Corporation. Method of making a sheet metal hub assembly. 3,981,068, Cl. 29-523.000.
Ivlev, Djuis Danilovich: *See—*
Berezhnoi, Igor Alexandrovich; Elatontsev, Albert Ivanovich; Ignatiev, Vladimir Vasilievich; Ivlev, Djuis Danilovich; Mayanov, Boris Veniaminovich; Svinukhov, Vasily Andriyanovich; Kuzmin, Vladimir Petrovich; Evdokimov, Igor Alexandrovich; and Zhidkov, Boris Alexeevich, deceased, 3,981,462.
Iwabuchi, Arata, to Mitsui Petrochemical Industries, Ltd. Collapsible high speed boat. 3,981,035, Cl. 9-2.00C.
Iwaki, Tsutomu: *See—*
Fukuda, Masataro; Iwaki, Tsutomu; and Kawano, Hiroshi, 3,981,749.
Iwasaki, Hirohumi: *See—*
Fukuoka, Yohei; Kato, Toshio; Imai, Norio; Nishikido, Joji; Hamada, Masato; Mikami, Hiroshi; Iwasaki, Hirohumi; and Koike, Toshihisa, 3,981,906.
Iwatsu Electric Co., Ltd.: *See—*
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IWS Nominee Company Limited: *See—*
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J. Bobst & Fils S.A.: *See—*
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J. & J. Marquardt, Firma: *See—*
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J. P. Stevens & Co., Inc.: *See—*
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Jackes-Evans Manufacturing Company: *See—*
Cornwell, Alexander M., Jr., 3,981,413.
Jackle, Reinhard, to Gebruder Staiger, Fabrik fur Feinmechanik und Elektrotechnik — Kunststoffspritzerei. Self contained battery operated clock fabricated on a single printed circuit board. 3,981,139, Cl. 58-23.00R.
Jackson, Joseph Monroe: *See—*
Hoehn, Steven Jon; and Jackson, Joseph Monroe, 3,982,079.
Jackson, William M.; and Peters, Edwin E., to Gulf & Western Manufacturing Company. Method for joining pipes. 3,981,061, Cl. 29-157.00T.
Jacobs, John E., to United States of America, Health, Education and Welfare. Dual frequency acoustic gas composition analyzer. 3,981,176, Cl. 73-24.000.
Jaeger, Raymond Edward; and Miller, Thomas John, to Bell Telephone Laboratories, Incorporated. Method of making optical waveguides from glass fibers. 3,981,705, Cl. 65-2.000.
Jaffe, Herbert: *See—*
Franklin, Stanley; and Jaffe, Herbert, 3,981,254.
James, David Richard. Lifting apparatus. 3,981,484, Cl. 254-148.000.
James, George Stephen; Dewar, Bruce Ian; and Moergeli, Walter Rudolf, to Parel Societe Anonyme. Electrochemical circulating bed cell. 3,981,787, Cl. 204-252.000.
Jaworski, Kasimir. Guide means for boring bars. 3,981,210, Cl. 82-1.400.
Janssen, Daniel Johannes Gerardus; and Hart, Cornelis Maria, to U.S. Philips Corporation. Line matching circuit for use in a tone pushbutton dialling subscriber's set provided with a tone generator. 3,982,078, Cl. 179-81.00R.
Janssen, Peter Johannes Michiel: *See—*
Verhoeven, Leonardus Adrianus Johannes; de Haan, Maarten Rutger; and Janssen, Peter Johannes Michiel, 3,982,272.
Japan Storage Battery Co., Ltd.: *See—*
Yonezu, Kunio; Tsubota, Masaharu; and Asai, Kenji, 3,981,742.
Japan Synthetic Rubber Co., Ltd.: *See—*
Takeuchi, Yasumasa; Ikeda, Takehiko; Sekimoto, Akira; Hayashi, Takashi; Sasaki, Toshimi; and Atsumi, Sabulo, 3,981,830.
Jaworski, Ernest G., to Monsanto Company. Method for increasing the sucrose content of growing plants. 3,981,718, Cl. 71-113.000.
Jeannet, Jean-Pierre; and Leuba, Jean-Pierre, to Tesa S.A. Adjustable meter. 3,981,201, Cl. 73-431.000.
Jedo, Antoni, to Centralny Osrodek Projektowokonstrukcyjny Maszyn Gorniczych "Komag". Baum jig. 3,981,799, Cl. 209-457.000.
Jefferis, Alan Kenneth; and Hodson, Kevin, to Post Office, The. Synchronization system for time division multiple access relay communications system. 3,982,075, Cl. 179-15.0BS.
Jensen, Gerald A.; and Lee, Conrad E., to Pako Corporation. Stripping and transfer roller assembly for sheet film processors. 3,981,496, Cl. 271-80.000.
Jensen, Harry Thomas, to United Technologies Corporation. Electrical interconnection circuitry from a rotating body to a relatively stationary body. 3,981,611, Cl. 416-61.000.
Jeromin, Lothar S.: *See—*
Nelson, Alan C.; and Jeromin, Lothar S., 3,981,727.
Jerrold Electronics Corporation: *See—*
Simons, Kenneth, 3,982,062.
Jesensky, Alexander; Meller, Frederick D.; Patzke, Robert C.; and Willey, Gilbert W., to Addressograph Multigraph Corporation. Optical device. 3,981,574, Cl. 353-101.000.
Jessen, Norman H.: *See—*
Blise, Bernard G.; and Jessen, Norman H., 3,981,194.

Johansen, Robert J., to Aubrey Manufacturing, Incorporated. Rangehood electrical wiring connection arrangement and method of connecting same. 3,981,069, Cl. 29-526.000.

Johansson, Ernst Lennart: *See—*
Lundstrom, Hans Per Olof; and Johansson, Ernst Lennart, 3,981,368.

John Wyeth & Brother Limited: *See—*
Curran, Adrian Charles Ward, 3,981,878.

Johns-Manville Corporation: *See—*
Loeffler, Romain Eugene; and Rollins, Forrest Theodore, 3,981,708.

Johns, Robert C., Jr., to Clark Equipment Company. Hydraulic drive assist for scrapers. 3,981,374, Cl. 180-14.00A.

Johns, Robert H. Practice violin and bow. 3,981,219, Cl. 84-275.000.

Johnsen, Edward L. Continuous business form or the like adapted for subsequent processing into combination mailing envelopes and return envelopes having a common back ply panel. 3,981,435, Cl. 229-69.000.

Johnson, Allen M. L., to Raymond Lee Organization, Inc., The, a part interest. Dual level toilet flusher. 3,981,029, Cl. 4-67.00A.

Johnson, Ernest D.; and Wright, Hugh W., to Goodyear Tire & Rubber Company, The. Clamping insert. 3,981,118, Cl. 52-716.000.

Johnson, John R., to Owens-Illinois, Inc. Apparatus for surface treating glass containers. 3,981,710, Cl. 65-158.000.

Johnson, Lloyd D., to Emhart Industries, Inc. Apparatus for applying adhesive to carton flaps. 3,981,122, Cl. 53-374.000.

Johnson Matthey & Co., Limited: *See—*
Bradford, Christopher William; and Middleton, Harry, 3,981,782.

Johnson Sheet Metal Works Corporation: *See—*
Hull, George Scott; Chaney, Louie V.; and Watson, Richard Dean, 3,981,054.

Johnston, Ross W.; and Witty, Barrie W., to Sperry Rand Corporation. Printhead for impact printer. 3,981,236, Cl. 101-93.140.

Johnston, Ross W.: *See—*
Thomas, Roy D.; and Johnston, Ross W., 3,981,235.

Johnston, Wilbur Dexter, Jr., to Bell Telephone Laboratories, Incorporated. Devices containing aluminum-V semiconductor and method for making. 3,982,265, Cl. 357-30.000.

Jones, Charles A. Method of making a compressed wood panel from peeled logs. 3,981,338, Cl. 144-309.00D.

Jones, Christopher Robin: *See—*
Williams, Malcolm; Crookes, Richard William; and Jones, Christopher Robin, 3,981,287.

Jones, Ferris E. Furniture combination. 3,981,533, Cl. 297-173.000.

Jones, Lloyd R.; and Roberts, Frederick W., deceased (by Roberts, Dorothy A., executrix), to Rolock Incorporated. Gas density detecting apparatus. 3,981,178, Cl. 73-30.000.

Jones, Robert A.: *See—*
Eldridge, Harry H.; Jones, Robert A.; Lindner, Gordon M.; and Hight, Paul H., 3,981,406.

Jones, Robert N., to Xerox Corporation. Xerographic imaging member having hexagonal selenium in inter-locking continuous paths. 3,981,728, Cl. 96-1.500.

Jordan, Kenneth T.; and Sowers, Norman A., to Sperry Rand Corporation. Power transmission. 3,981,648, Cl. 418-267.000.

Jorgensen, Arne R., to Illinois Tool Works Inc. Boring bar with removable and indexable cutting insert. 3,981,607, Cl. 408-146.000.

Joseph Lucas Industries: *See—*
Smith, Trevor Stanley, 3,981,141.

Joto Chemical Company Limited: *See—*
Yamamoto, Sadanori; and Osada, Isao, 3,981,840.

Joynson, Reuben E.; and Mundy, Joseph L., to General Electric Company. Pattern recognition machine for analyzing line orientation. 3,982,227, Cl. 340-146.3AE.

Judin, Vladimir Vasilievich: *See—*
Karatsjuba, Anatoly Prokofievich; Kmita, Tatyana Georgievna; Kruglov, Igor Ivanovich; Kurinny, Vladimir Ivanovich; Kurnosov, Anatoly Ivanovich; Ryzhikov, Igor Veniaminovich; and Judin, Vladimir Vasilievich, 3,982,262.

Jupa, Edward C.; Meeder, Raymond L.; and Richter, Edward K., to G. D. Searle & Co. Collimator changer for scintillation camera. 3,982,133, Cl. 250-505.000.

Jureller, John F.: *See—*
Soule, Hendrick H., Jr.; and Jureller, John F., 3,982,245.

K-tel International, Inc.: *See—*
Koblick, Jeffrey M., 3,981,508.

Kabs, Klaus: *See—*
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Kabushiki Kaisha Neriki: *See—*
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Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
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Miyazaki, Tsutomu; Kato, Takashi; Ueda, Shozo; and Yoshizawa, Toshio, 3,981,551.
Nakayama, Shozo; Toriyama, Takeshi; and Higuchi, Takeshi, 3,981,629.

Kaczmarek, Al. Device for processing refuse. 3,981,455, Cl. 241-32.000.

Kaes, Hans-Herbert: *See—*
Broemer, Heinz; Kaes, Hans-Herbert; and Pfeil, Emanuel, 3,981,736.

Kafafian, Haig. Communications and control method and apparatus for persons who may have muscular incoordination and/or spasticity. 3,982,236, Cl. 340-147.00R.

Kaiser, Fritz: *See—*
Voigtlander, Wolfgang; Kaiser, Fritz; Schaumann, Wolfgang; and Stach, Kurt, 3,981,862.

Kalb, Henry T.; Cline, Virgil A., Jr.; and Bomar, Bruce W., to United States of America, Air Force. Laser velocimeter real time digital data analyzer. 3,982,101, Cl. 235-152.000.

Kaller, Yakov Alexandrovich: *See—*
Dashevsky, Zinovy Moiseevich; Kaller, Yakov Alexandrovich; Kolomoets, Nikolai Vasilievich; and Sgibnev, Igor Vladimirovich, 3,981,751.

Kameda Seika Co., Ltd.: *See—*
Koizumi, Eiji, 3,982,032.

Kamen, Barton A.: *See—*
Caston, J. Douglas; and Kamen, Barton A., 3,981,983.

Kamezawa, Yasutoki: *See—*
Takahashi, Kenzi; Kouchi, Toshihiro; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,981,730.

Kampe, Wolfgang: *See—*
Fauland, Erich; Kampe, Wolfgang; Thiel, Max; Bartsch, Wolfgang; and Schaumann, Wolfgang, 3,982,012.

Kan, Peter T.: *See—*
Cenker, Moses; Narayan, Thirumurti L.; and Kan, Peter T., 3,981,829.

Kantor, Frederick W. Rotary thermodynamic compressor. 3,981,627, Cl. 417-207.000.

Kaplan, Richard B.; Gonnella, Sebastian; and Abrams, Walter M., to Ultramet. Heat radiating coating and method of manufacture thereof. 3,982,148, Cl. 313-330.000.

Karasawa, Tamotsu, to Canon Kabushiki Kaisha. Light-modulating device. 3,981,565, Cl. 350-266.000.

Karashima, Masashi. Showcase. 3,981,552, Cl. 312-250.000.

Karatsjuba, Anatoly Prokofievich; Kmita, Tatyana Georgievna; Kruglov, Igor Ivanovich; Kurinny, Vladimir Ivanovich; Kurnosov, Anatoly Ivanovich; Ryzhikov, Igor Veniaminovich; and Judin, Vladimir Vasilievich. Semiconductor indicating instrument. 3,982,262, Cl. 357-17.000.

Karnilaw, John: *See—*
Christ.e, Nick J.; and Karnilaw, John, 3,981,679.

Karpov, Vladimir Fedorovich: *See—*
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Kato, Haruhiro; Toyoda, Tsunehiko; and Tanabe, Hiroyuki, to Dai Nippon Co., Ltd. Method for coating inner faces of metal pipes of small diameter. 3,982,050, Cl. 427-181.000.

Kato, Takashi: *See—*
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Katow, Takehumi: *See—*
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Katsuda, Yoshio, to Dainippon Jochugiku Kabushiki Kaisha. 5-Phenylvinylfurfurylester of chrysanthemumic acid. 3,982,013, Cl. 424-285.000.

Katz, Ira: *See—*
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Kauffman, Andrew G.; and Michelson, James D. Boat docking device. 3,981,261, Cl. 114-230.000.

Kaufman, Stanley; and Sabia, Raffaele Antonio, to Bell Telephone Laboratories, Incorporated. Method for reclaiming waterlogged plastic insulated conductor cable. 3,981,947, Cl. 264-36.000.

Kaufman, Warren F., to Ford Motor Company. Engine exhaust gas recirculating control. 3,981,283, Cl. 123-119.00A.

Kawabata, Hidetoshi: *See—*
Tanaka, Susumu; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, 3,981,575.

Kawai, Yoshio, to Kurcha Kagaku Kogyo Kabushiki Kaisha. Input transfer system for electronic computer. 3,982,110, Cl. 235-151.300.

Kawakami, Waichiro: *See—*
Taniguchi, Masao; Machi, Sueo; Kawakami, Waichiro; Hashimoto, Shoji; Kawamura, Keita; and Aoki, Shingi, 3,981,815.

Kawamura, Kazuhiro; and Mizutani, Kunihiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Protective device for rotary engine oil seal. 3,981,642, Cl. 418-91.000.
Kawamura, Keita: *See*—
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Kay, Thomas D.; and Harper, John W., to United States of America, Air Force. Patient restraining strap for scintiphotography. 3,982,132, Cl. 250-456.000.
Kehr, Clifton Leroy: *See*—
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Guthrie, James Leverette; and Kehr, Clifton Leroy, 3,981,904.
Keim, Cameron D., to Gerber Products Company. Container with improved pour spout. 3,981,430, Cl. 229-17.00R.
Kellar, James S.; Carson, Don B.; and Boyd, David M., to UOP Inc. Control of hydrocarbon deasphalting process. 3,981,797, Cl. 208-309.000.
Kelly, Edward A. Sewing machine lubrication system and pump therefor. 3,981,257, Cl. 112-256.000.
Kelly, Ralph; and Ritter, Edmond Jean, to Cincinnati Milacron, Inc. Skin protective compositions. 3,981,990, Cl. 424-78.000.
Kelly, Thomas James, to Du Pont de Nemours, E. I., and Company. Chloroprene polymer isolation. 3,981,854, Cl. 528-481.000.
Kelsey-Hayes Company: *See*—
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Kemira Oy: *See*—
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Kemp, Donald P., to Gast Manufacturing Corporation. Compressor head construction. 3,981,631, Cl. 417-312.000.
Kennametal Inc.: *See*—
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Kennecott Copper Corporation: *See*—
Hopper, William H. L., 3,981,753.
KeNova AB: *See*—
Nilson, Billy N., 3,981,419.
Kenyon, Robert Sydney; Garnett, John Lyndon; and Liddy, Michael James. Enzyme insolubilization. 3,981,775, Cl. 195-68.000.
Kerber, Dathan R.; Hocking, Thomas A.; and Vande Wiele, John L., to International Harvester Company. Leveling mechanism for harvester headers. 3,981,125, Cl. 56-14.500.
Kern, Jorg: *See*—
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Kern, Larry J.; and Webb, John D. Concrete treating composition. 3,981,834, Cl. 260-17.00R.
Kerr-McGee Chemical Corporation: *See*—
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Klein, Max, to Normac, Inc. Reactor process conditions control. 3,981,855, Cl. 526-63.000.
Klier, Shimon. Continuous treatment of textile materials. 3,981,162, Cl. 68-5.00E.
Klinck, Martin; and Mersiowsky, Udo, to U.S. Philips Corporation. Circuit arrangement for the formation of a sum and/or difference signal. 3,982,109, Cl. 235-150.300.
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Kluge, Albert E., Jr., to Caterpillar Tractor Co. Vehicle protection means. 3,981,376, Cl. 180-70.00P.
Kmelisch, Wolfgang, to Siemens Aktiengesellschaft. Twin drive for rolling mills. 3,981,171, Cl. 72-249.000.
Kmita, Tatyana Georgievna: *See*—
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Knight, Bill J. Anode casting machine. 3,981,353, Cl. 164-332.000.
Knox, John Henderson, to University of Edinburgh. Gradient storage method for liquid chromatography. 3,981,801, Cl. 210-31.00C.
Kobe Steel Ltd.: *See*—
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Koblick, Jeffrey M., to K-tel International, Inc. Golf practice device. 3,981,508, Cl. 273-200.00B.
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Koeber, Henry Jacob, to Bell & Howell Company. Two speed planetary gear train. 3,981,423, Cl. 226-42.000.
Koen, Toshiharu, to Victor Company of Japan, Limited; and Nifco Inc. Push-pull-lock device for slide shaft. 3,981,599, Cl. 403-107.000.
Koenig, Robert John, to United Technologies Corporation. Coolable blade tip shroud. 3,981,609, Cl. 415-117.000.
Kohkoku Chemical Industry Co., Ltd.: *See*—
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Koizumi, Eiji, to Kameda Seika Co., Ltd. Process for the production of rice crackers. 3,982,032, Cl. 426-296.000.
Kojima, Yasuhiro; Matunaga, Niiti; and Nawa, Motoki, to Nippon Toki Kabushiki Kaisha. Process for manufacturing printed substrates and decalcomania compositions used therefor. 3,981,761, Cl. 156-235.000.
Kokke, Antoine H.: *See*—
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Kolomoets, Nikolai Vasilievich: *See*—
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Kondo, Fumio; Kondo, Masayuki; Itoh, Tsuneyoshi; and Sato, Koji, to Tokyo Kogaku Kikai Kabushiki Kaisha. Edge processing of chemically toughened lenses. 3,981,709, Cl. 65-30.00E.
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Koppers, Kurt, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Cutting tool. 3,981,057, Cl. 29-96.000.

Koral, Joseph F.; and Beaufait, Daniel L., to General Motors Corporation. Vehicle body sunroof. 3,981,531, Cl. 296-137.00G.

Koshimizu, Masaki: *See—*
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Kossler, Ivo; and Habr, Karel. Flow-through capillary viscometer. 3,981,182, Cl. 73-55.000.

Kouchi, Toshihiro: *See—*
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Kouno, Kaoru: *See—*
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Kovar, Henry Charles, to Cornelius Company, The. Coin size tester. 3,981,384, Cl. 194-102.000.

Kraftwerk Union Aktiengesellschaft: *See—*
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Kranenberg, Helmut; and Hostetter, Richard S., Jr., to Bethlehem Steel Corporation. Method for controlling the temperature of steel during hot-rolling on a continuous hot-rolling mill. 3,981,752, Cl. 148-12.00B.

Kratcoski, Francis L.; and Brahos, William, to Oce-van der Grinten N.V. Apparatus for fixing toner images. 3,982,094, Cl. 219-216.000.

Krauss-Maffei Aktiengesellschaft: *See—*
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Kreuzer, Laurence G., to DuPage Manufacturing Company. Two-part worm drive clamp with variable length band-forming part. 3,981,053, Cl. 24-274.00R.

Krey, John F.; Regelson, Ephraim; and Crecelius, John D., to United States of America, Navy. Exhaust cooling system. 3,981,449, Cl. 239-127.300.

Krishna, Surinder: *See—*
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Kroebig, Helmut L., to United States of America, Air Force. Plasma deposited rider rings for hot displacer. 3,981,155, Cl. 62-6.000.

Krol, Salomon, to Groupe Europeen pour la Technique des Turbines a Vapeur G.E.T.T. Continuous connection device for the mobile blades of a turbo-machine. 3,981,615, Cl. 416-190.000.

Kruger, Emilio; Ruffini, Guglielmo; Gandini, Giovanni; and Ghislandi, Franco, to Vita Mayer & C. Treatment of wood chips with an alkali metal borohydride solution followed by mechanical defibration. 3,981,765, Cl. 162-80.000.

Kruglov, Igor Ivanovich: *See—*
Karatsjuba, Anatoly Prokofievich; Kmita, Tatyana Georgievna; Kruglov, Igor Ivanovich; Kurinny, Vladimir Ivanovich; Kurnosov, Anatoly Ivanovich; Ryzhikov, Igor Veniaminovich; and Judin, Vladimir Vasilievich, 3,982,262.

Krusko, Evelyn H., to Scott Paper Company. Multilayer one-piece disposable diapers. 3,981,306, Cl. 128-287.000.

Kubota, Shokichi: *See—*
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Kumagai, Morio: *See—*
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Laamanen, Virpi: *See—*
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Laber, Georg; and Schutze, Eberhard, to Sandoz Ltd. Synergistic compositions. 3,982,007, Cl. 424-270.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
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Laitner, Charles F. A., Jr., to Caterpillar Tractor Co. Key retaining device. 3,981,600, Cl. 403-318.000.

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Lamb, James F.: *See—*
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Lark, John C., to Standard Oil Company (Indiana). Starch/polyester resin composition. 3,981,833, Cl. 260-9.000.

Larson, Willis August, to Globe-Union Inc. Method of fabricating keyboard apparatus. 3,981,757, Cl. 156-8.000.

Larsson, Raymond P.; and Witonsky, Robert J., to Bio-Medical Sciences, Inc. Temperature responsive sterility indicator. 3,981,683, Cl. 23-253.0TP.

Lattin, Kenneth R.; and Erickson, Gerald L., to United States of America, Energy Research and Development Administration. Method and means of monitoring the effluent from nuclear facilities. 3,982,129, Cl. 250-364.000.

Laudien, Dieter: *See—*
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Leary, Bruce; and Lubbock, Frederick John, to Dulux Australia Ltd. Novel autoxidative derivatives of maleinized monocarboxylic fatty acid. 3,981,895, Cl. 260-404.800.

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Le Cornec, Andre. Dwelling house. 3,981,110, Cl. 52-169.00R.

Leduc, Gerard; and Leduc, Michel. Hydraulic swash plate pumps. 3,981,630, Cl. 417-269.000.

Leduc, Michel: *See—*
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Lee, Conrad E.: *See—*
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Cuff, David William, 3,981,959.
LeFebre, Halbert Allen. Metering pump. 3,981,632, Cl. 417-413.000.
Leffel, Myron J. Artificial fishing bait. 3,981,094, Cl. 43-35.000.
Lehman, William O.: *See—*
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Lehtinen, Antti, to Valmet Oy. Web-forming method and apparatus for paper-manufacturing machines. 3,981,768, Cl. 162-199.000.
Leigh, Steven, to Vymatt S.A. Pharmaceutical skin compositions. 3,981,996, Cl. 424-243.000.
Lemberger, Earl S.: *See—*
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Lemmon & Snoap Co.: *See—*
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Leppard, Colin James, to CJB Development Limited. Process for the removal of carbon dioxide from gases. 3,981,698, Cl. 55-31.000.
Lerner, Edward Mark; Peterson, David Cartwright; Quin, Terrence Thomas; and Ruel, Bernard George, to Bell Telephone Laboratories, Incorporated. Memory diagnostic arrangement. 3,982,111, Cl. 235-153.0AM.
Lerond, Andre: *See—*
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Levine, Morris M.; and Cake, Arthur F., to Uranus Electronics, Inc. Digital display timepiece. 3,981,138, Cl. 58-23.00R.
Levy, Jean Michel Bloch, to Central Corsetera S.A. Apparatus for shaping a brassiere. 3,981,670, Cl. 425-398.000.
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Lindstrom, Roald E.: *See—*
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Linke, Wolfgang; Herrle, Karl; Schwarz, Wolfgang; and Perner, Johannes, to BASF Aktiengesellschaft. Hair setting compositions containing easily removable neutralized copolymers. 3,981,987, Cl. 424-47.000.
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Lipcon, Jesse B., to Digital Equipment Corporation. Self-zeroing analog-to-digital conversion system. 3,982,241, Cl. 340-347.0CC.
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Lo, Gerald Joy-Pak; Papworth, Francis Leo; Tenne-Sens, Nicolas Elmars; O'Donovan, Michael Valentine; and Dziub, Gerald, to RCA Corporation. Metal plated body composed of graphite fibre epoxy composite. 3,982,215, Cl. 333-73.00W.
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Lobunez, Walter; and Berkowitz, Sidney, to FMC Corporation. Hydrochlorination of vinylidene chloride to produce methyl chloroform. 3,981,939, Cl. 260-658.00R.
Lockwood, George C., to NCR Corporation. High speed bistable multivibrator circuit. 3,982,140, Cl. 307-279.000.
Loeffler, Romain Eugene; and Rollins, Forrest Theodore, to Johns-Manville Corporation. System for producing blankets and webs of mineral fibers. 3,981,708, Cl. 65-4.00R.
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Lubar, Bertram H., to United States of America, Navy. General method of geometrical passive ranging. 3,982,246, Cl. 343-112.00C.
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Ludlow, Kenneth G., to United States of America, Air Force. Launch lock device. 3,981,467, Cl. 244-158.000.
Ludovici, Bruno F.; and Megla, Gerhard K., to Corning Glass Works. Optical information storage system. 3,982,151, Cl. 313-465.000.
Luebke, Clem J.; Beck, Norman L.; and Daniels, Lowell W., to Broaster Co., The. Receptacle handle assembly. 3,981,044, Cl. 16-114.00A.
Luisi, James A.; Padgett, Clarence W.; and Street, Dana C., to Rockwell International Corporation. High speed-low cost, clock controlled CMOS logic implementation. 3,982,138, Cl. 307-205.000.
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Lundqvist, Karl Gustav Emanuel. Spike tool. 3,981,526, Cl. 294-25.000.
Lundsgart, Henning Borge, to Dansk Industri Syndikat A/S. Fluid flow control valve. 3,981,478, Cl. 251-29.000.
Lundstrom, Hans Per Olof; and Johansson, Ernst Lennart, to Sandvik Aktiebolag. Coupling means in a drilling machine. 3,981,368, Cl. 173-104.000.
Lunsford, Jimmy L.; Schroff, Dennis E.; and Steffey, David R., to General Motors Corporation. Gas turbine engine geometry control. 3,981,140. Cl. 60-39.030.
Lupke, Gerd P.H. Apparatus for making high speed corrugated plastic tubing. 3,981,663, Cl. 425-326.00B.
Luther, Hans Werner; and Bender, Peter, to Rheinmetall G.m.b.H. Fin-stabilized subcaliber projectile. 3,981,246, Cl. 102-93.000.

Lutz, Albert William; and Walworth, Bryant Leonidas, to American Cyanamid Company. 2,3,5-Substituted-6-trifluoromethyl-1,3-diazin-4-ones herbicides. 3,981,715, Cl. 71-92.000.

Lynch, Robert T.; and Reis, James J., to Northrop Corporation. Class of transform digital processors for compression of multidimensional data. 3,981,443, Cl. 235-156.000.

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Maddox, Harry L., to Western Electric Company, Inc. Switching voltage regulator with low RFI noise. 3,982,174, Cl. 323-17.000.

Madonna, Nicholas W. Easily attached bicycle locking apparatus. 3,981,166, Cl. 70-234.000.

Magara, Osamu: *See—*
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Maier, Elmar, to Hilti Aktiengesellschaft. Explosive charge driven setting gun. 3,981,424, Cl. 227-10.000.

Maiwald, Heinz; Hockele, Gunter; and Sauer, Hermann, to Chemische Werke Huls Aktiengesellschaft. Process for the recovery of bound mercury from mercury-containing catalysts. 3,981,967, Cl. 423-107.000.

Malden Mills, Inc.: *See—*
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Maloof, Ralph: *See—*
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Manabe, Keiji; and Ishii, Yoshio, to Matsushita Electric Industrial Co., Ltd. Electrical garden shears. 3,981,077, Cl. 30-233.000.

Mandel, Heinrich, to Rheinisch-Westfalisches-Elektrizitatswert Aktiengesellschaft. Method of producing deuterium-oxide-enriched water. 3,981,977, Cl. 423-580.000.

Manning, Robert E.: *See—*
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Manwiller, Carl Harding; and Sperati, Carleton Angelo, to Du Pont de Nemours, E. I., and Company. Polytetrafluoroethylene molding powder. 3,981,852, Cl. 526-250.000.

Manwiller, Carl Harding, to Du Pont de Nemours, E. I., and Company. Polytetrafluoroethylene molding powder from polytetrafluoroethylene fine powder. 3,981,853, Cl. 526-255.000.

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Marconi Company Limited, The: *See—*
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Margalit, Nehemiah, to ESB Incorporated. Non-aqueous, primary battery having a blended cathode active material. 3,981,748, Cl. 429-164.000.

Maringer, Albert, to Siemens Aktiengesellschaft. Circuit arrangement for generating a sampling pulse raster adapted to the variable period of quasiperiodic events. 3,982,193, Cl. 328-151.000.

Markewitz, Gregor: *See—*
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Markiewitz, Kenneth H., to ICI United States Inc. Mono-substituted ureas. 3,981,913, Cl. 260-553.00R.

Markusch, Peter; Dieterich, Dieter; and Reiff, Helmut, to Bayer Aktiengesellschaft. Inorganic-organic plastic. 3,981,831, Cl. 260-2.5AM.

Marquardt, Erich; Storz, Werner; and Sachs, Eckehardt, to J. & J. Marquardt, Firma. Electrical switch construction. 3,982,086, Cl. 200-67.0DA.

Marriott, James G., to Libbey-Owens-Ford Company. Electrically heated zoned window systems. 3,982,092, Cl. 219-203.000.

Mars Limited: *See—*
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Marson Fastener Corporation: *See—*
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Maruyama, Koichi: *See—*
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Mason, David Robert; Cole, Susan Margaret; Rees, John Michael; and Coaton, James Richard, to Thorn Lighting Limited. Incandescent lamps. 3,982,046, Cl. 427-106.000.

Massachusetts Institute of Technology: *See—*
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Masuda, Yoshitaka: *See—*
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Matsuo, Takashi: *See—*
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Moriyama, Akio; Fukai, Masakazu; Asai, Komei; and Mori, Koshiro, 3,981,816.

Matsuyama, Glen, to Graphic Arts Packaging Corporation. Blank for a simulated jewel box. 3,981,431, Cl. 229-34.0HW.

Matsuyama, Junichi; Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Ohi, Reiichi; and Kondo, Tokiharu, deceased, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsions used for electron beam recording. 3,982,044, Cl. 427-43.000.

Matsuzawa, Mitsuo; and Mitarai, Kaoru, to Trio Electronics Incorporated. Station selecting device having improved noise discrimination circuitry. 3,982,188, Cl. 325-470.000.

Matthes, William R.: *See—*
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Matusek, Miroslav: *See—*
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Matzen, Walter T.; and Workman, Wilton L., to Texas Instruments Incorporated. Integrated injection logic having high inverse current gain. 3,982,266, Cl. 357-44.000.

Maucher, Edmund, to Robert Bosch G.m.b.H. Hydraulic control system. 3,981,228, Cl. 91-415.000.

Mauleon, Jean-Louis: *See—*
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Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. O-Alkyl-O-n-propyl-O-pyrimidin(2)yl-thionophosphoric acid esters. 3,981,993, Cl. 424-200.000.

Mavrovic, Ivo. Apparatus for controlling urea system. 3,981,684, Cl. 23-260.000.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
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Mayer, Fritz; Kern, Jorg; and Nachbur, Hermann, to Ciba-Geigy AG. Process for flameproofing organic fiber material by the transfer process. 3,982,053, Cl. 427-248.000.

Mayes, George C. Security apparatus for louver windows and doors. 3,981,525, Cl. 292-259.00R.

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Aimbinder, Mark Borisovich; Zhitomirsky, Mikhail Iosifovich; Denisova, Maria Vasilievna; Grabilin, Anatoly Mikhailovich; Lapushkin, Grigory Alexeevich; Kupershmidt, Moisei Zusievich; Mazov, Jury Alexeevich; Terentiev, Viktor Petrovich; Sergeev, Jury Vasilievich; and Muzylev, Vladimir Sergeevich, 3,981,130.

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McCain, William B.; Cosgrove, James F.; and Bewersdorf, Elmer D. Sheet trimming machine. 3,981,212, Cl. 83-155.000.

McCall, Robert, to Du Pont de Nemours, E. I., and Company. Azeotropic nitration of benzene. 3,981,935, Cl. 260-645.000.

McCardle, Arthur, Jr.; Israel, George H., Jr.; Trombetta, Frank J.; and Howard, David F., to United States of America, Air Force. In-flight modulating thrust reverser. 3,981,450, Cl. 239-265.310.

McClaflin, Gifford G.; and Durr, Albert M., Jr., to Continental Oil Company. Soluble oil concentrate. 3,981,808, Cl. 252-33.300.

McConnell, Edmund Alexander: *See—*
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McCroskey, George A., Sr., to Raymond Lee Organization, Inc., The, a part interest. Process for installing an arch support in a conventional shoe. 3,981,037, Cl. 12-146.00S.

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McDowell, John David, Jr.; and Nutley, Paul John, to Procter & Gamble Company, The. Nonspurting dispensing closure. 3,981,421, Cl. 222-521.000.

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Medina, Palemon T. Snow liquifying apparatus. 3,981,296, Cl. 126-343.50R.

Medovar, Boris Izrailevich; Saenko, Vladimir Yakovlevich; Schupak, Grigory Bentsionovich; Alferov, Jury Fedorovich; Karpov, Vladimir Fedorovich; Berman, Kirill Adolfovich; Pogoretsky, Vitaly Vasilievich; Ovseichuk, Vitaly Alexandrovich; Zabolotsky, Petr Stepanovich; Boiko, Georgy Alexandrovich; Oleinik, Vladimir Ivanovich; Grodzitsky, Stanislav Vitalievich; Popov, Viktor Andreevich; and Chvertko, Anatoly Ivanovich. Electroslag remelting plant. 3,981,349, Cl. 164-252.000.

Mee, Jack E.; Hamilton, Thomas N.; Archer, John L.; and Heinz, David M., to Rockwell International Corporation. Method for producing single crystal films. 3,982,049, Cl. 427-128.000.

Meeder, Raymond L.: *See—*
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Mehrhof, Werner: *See—*
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Mele, Joseph J.: *See—*
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Meller, Frederick D.: *See—*
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Melton, Joseph E., to Melton Systems, Inc. Floor finish applicator. 3,981,596, Cl. 401-48.000.

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Merz, Herbert; Langbein, Adolf; Walther, Gerhard; and Stockhaus, Klaus, to Boehringer Ingelheim GmbH. N-[(Methoxymethyl-furyl)-methyl]-morphinans or -6,7-benzomorphans and salts thereof. 3,981,874, Cl. 260-293.540.

Merz, Herbert; Langbein, Adolf; Walther, Gerhard; and Stockhaus, Klaus, to Boehringer Ingelheim GmbH. 2-Tetrahydrofurfuryl-5-(methyl or phenyl)-9β-methyl-2'-oxy-6,7-benzomorphans and salts thereof. 3,982,005, Cl. 424-267.000.

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Metzger, Carl; Eue, Ludwig; and Schmidt, Robert Rudolf, to Bayer Aktiengesellschaft. Cyclic N-thiadiazolyl-(2)-carboxylic acid compounds and herbicidal compositions. 3,981,714, Cl. 71-90.000.

Metzger, Karl Georg: *See—*
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Meyer, Bruce R.: *See—*
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Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. Process for preparing 4-aryl of hetero-6-amino-3,4-dihydropyrid-2-one-3,5-dicarboxylic acid ester. 3,981,882, Cl. 260-295.50R.

Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 2-Amino-4 H-pyrane. 3,981,893, Cl. 260-345.800.

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Milewicz, Norbert W. Marine propeller lock. 3,981,617, Cl. 416-244.00B.

Miller, David J.; and Wiewiorowski, Tadeusz K., to Freeport Minerals Company. Solvent extraction of nickel from ammoniacal solutions. 3,981,968, Cl. 423-139.000.

Miller, Neil W., to Merck & Co., Inc. Pellet dispenser. 3,981,402, Cl. 206-534.200.

Miller, Richard C.; and Payne, Charles C., to Nalco Chemical Company. Antiskid coating. 3,981,820, Cl. 252-301.160.

Miller, Thomas John: *See—*
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Milling, Robert W.; and Von Ohain, Hans J. P., to United States of America, Air Force. Dual stage supersonic diffuser. 3,981,144, Cl. 60-270.00R.

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Miranti, Joseph P., Jr.; and Woodland, Carl R., to Dayco Corporation. Endless power transmission belt. 3,981,206, Cl. 74-233.000.

Mislin, Roland; and Uehlinger, Hanspeter, to Sandoz Ltd. Alkoxy- and cyclohexyloxycarbonylaminophenyl-azo-hydroxynaphthalenes containing at least one sulfo group. 3,981,858, Cl. 260-201.000.

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Mitchell, John Richard; Buckley, Keith; and Burrows, Ian Edward, to Mars Limited. Gelling and thickening agents. 3,982,003, Cl. 426-1.000.

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Mitter, Mathias, to Mitter & Co. Control device for controlling the level of a liquid in a container. 3,981,619, Cl. 417-38.000.
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Miyazaki, Tsutomu; Kato, Takashi; Ueda, Shozo; and Yoshizawa, Toshio, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Means for transporting yarn packages produced by spinning machinery. 3,981,551, Cl. 312-250.000.
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Molins Machine Company, Inc.: *See—*
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Molitor, Victor D. Purifier. 3,981,699, Cl. 55-208.000.
Momonoi, Kaishu: *See—*
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Montoro, Fernando; Vila-Coro, Antonio; and Calatayud, Jose, to Especialidades Latinas Medicamentos Universales S.A. Vincamine 2-ketoglutarate and compositions containing vincamine 2-ketoglutarate. 3,982,002, Cl. 424-267.000.
Moody, Roy A.; and Fulton, Ronald T., to Panduit Corporation. Smooth exterior dual clamp. 3,981,048, Cl. 24-16.0PB.
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Moore Industries: *See—*
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Moore, John R., to International Telephone and Telegraph Corporation. Method of breaking glass fibers and tool therefor. 3,981,422, Cl. 225-2.000.
Moore, Leonard W.; Bodle, Ronald L.; and Fiederer, Conrad, to Moore Industries. Pressure transducer. 3,981,199, Cl. 73-420.000.
Moreau, Lorenzo. Motorized snow vehicle stand. 3,981,372, Cl. 180-5.00R.
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Morgan, J. Robert. Eyeglass structure. 3,981,569, Cl. 351-47.000.
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Moskowitz, David; and Uy, James C., to Ford Motor Company. Apex seal composition for rotary engines. 3,981,062, Cl. 29-182.700.
Mossman, Ralph A., to Tektronix, Inc. Bistable storage tube having storage dielectric of phosphor particles coated with secondary emissive material. 3,982,150, Cl. 313-398.000.
Motiva, Ltd.: *See—*
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Mueller, Hans W.; and Shattuck, Richard E., to SCM Corporation. Typing machine key action. 3,981,385, Cl. 197-17.000.
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Munker, Gert, to Palitex Project-Company G.m.b.H. Mechanism for transporting a yarn end in a textile machine. 3,981,128, Cl. 57-34.00R.
Munro, Hamish David, to Procter & Gamble Company, The. Hard surface cleaning composition. 3,981,826, Cl. 252-526.000.
Murasaki, Hiroshi: *See—*
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Murray, Harry Elmer. Urethral catheter. 3,981,299, Cl. 128-349.00B.
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Mutsch, Edward L.; and Harrington, Joseph Kenneth, to Minnesota Mining and Manufacturing Company. N-alkylsulfonylperfluoroalkanesulfonanilides. 3,981,914, Cl. 260-556.00F.

Muzylev, Vladimir Sergeevich: *See—*
Aimbinder, Mark Borisovich; Zhitomirsky, Mikhail Iosifovich; Denisova, Maria Vasilievna; Grabilin, Anatoly Mikhailovich; Lapushkin, Grigory Alexeevich; Kupershmidt, Moisei Zusievich; Mazov, Jury Alexeevich; Terentiev, Viktor Petrovich; Sergeev, Jury Vasilievich; and Muzylev, Vladimir Sergeevich, 3,981,130.

Mydels, John W., to Allis-Chalmers Corporation. Spring trip cultivator shank assembly. 3,981,367, Cl. 172-265.000.

Myer, William R., to Geometric Machine and Design Corporation. Latching means for releasably supporting a driven rotatable member. 3,981,509, Cl. 279-1.00R.

Myers, Claude V., to Cities Service Company. Apparatus for drying carbon black pellets. 3,981,659, Cl. 425-222.000.

Myers, Frank W.: *See—*
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Nagai, Tsuyoshi, to Arakawashatai Kogyo Kabushiki Kaisha. Locking device for adjustable seat track structure. 3,981,473, Cl. 248-430.000.

Nagaike, Naofumi: *See—*
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Nakamoto, Soichi: *See—*
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Nakamura, Akiyoshi, to Minolta Camera Kabushiki Kaisha. Retrofocus wide angle lens system. 3,981,563, Cl. 350-214.000.

Nakamura, Shoji, to Kyoei Steel Works, Ltd. Method for receiving molten steel from an electric furnace. 3,981,719, Cl. 75-13.000.

Nakamura, Yasuharu: *See—*
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Nakashima, Kunihiko; Muroi, Ryoichi; Imai, Mitsuo; and Sato, Kenji, to Toyoda Gosei Kabushiki-Kaisha (Toyoda Synthetics Co., Ltd.). Graft copolymers and process for producing same. 3,981,958, Cl. 260-878.00R.

Nakayama, Shozo; Toriyama, Takeshi; and Higuchi, Takeshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Swash-plate type compressor for air conditioning of vehicles. 3,981,629, Cl. 417-269.000.

Nakazawa, Yoshiyuki: *See—*
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Narayanan, Venkatachala L.: *See—*
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National Semiconductor Corporation: *See—*
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Nawa, Motoki: *See—*
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Naylor, Thomas K., to American Optical Corporation. Timing-error compensation for low-speed tape systems. 3,982,277, Cl. 360-27.000.

NCR Corporation: *See—*
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Murata, Minoru; Sugiyama, Koichi; and Ikeda, Hisao, 3,981,735.

Neal, Louis A. Mail box. 3,981,436, Cl. 232-17.000.

Nelson, Alan C.; and Jeromin, Lothar S., to Xerox Corporation. Signal amplification by charging and illuminating a partially developed latent electrostatic image. 3,981,727, Cl. 96-1.300.

Nelson, Alvin I.; Singh, B. P. N.; and Singh, Surjan, to University of Illinois Foundation. Apparatus for the preparation of a soybean beverage base. 3,981,234, Cl. 99-483.000.

Nelson, George R., Jr., to Grumman Aerospace Corporation. Method and apparatus for preventing pump cavitation. 3,981,618, Cl. 417-12.000.

Nelson, Norman A., to Upjohn Company, The. 5-Oxa-17,18-dehydroprostaglandin-F_1 -type analogs. 3,981,902, Cl. 260-468.00D.

Nerenberg, Robert W.: *See—*
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Neubert, Rolf; Schiebenhofer, Harm; and Wehling, Rolf, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Open-end spinning unit. 3,981,133, Cl. 57-58.950.

Neutkens, Christiaan H.: *See—*
Slathar, Donald A.; and Neutkens, Christiaan H., 3,981,394.

Newman, Peter John; and Watson, Charles Andrew, to Lever Brothers Company. Dentifrice including a lustre imparting agent. 3,981,988, Cl. 424-49.000.

Newman, Richard, executor: *See—*
Halasz, Alexander; Brody, Frederick, deceased; and Newman, Richard, executor, 3,981,677.

Newton, John E.; Bohacz, Maxine; and Lyon, Jerry H., to United States of America, Army. Minipowered optional self checking electronic timer for ordnance. 3,982,192, Cl. 328-129.000.

Neyraud, Rene, to Verdol S.A. Device for making tuft fabric. 3,981,253, Cl. 112-79.00A.

Nichols, George Frederick: *See—*
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Nicholson, John Stuart: *See—*
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Nicolas, Gerard, to Commissariat a l'Energie Atomique. Method of connecting electronic microcomponents. 3,981,076, Cl. 29-626.000.

Niess, Rolf, to BASF Aktiengesellschaft. Manufacture of 3-amino-2,1-benzisothiazoles. 3,981,883, Cl. 260-304.00A.

Nifco Inc.: *See—*
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Nikawitz, Edward J., to Givaudan Corporation. Bacteriostatic substituted benzanilide compositions and methods for their use. 3,981,814, Cl. 252-107.000.

Nilson, Billy N., to KeNova AB. Self-closing closures. 3,981,419, Cl. 222-494.000.

Ninagawa, Yoichi: *See—*
Nishida, Takashi; Ninagawa, Yoichi; Omura, Yoshiaki; Mori, Fumio; Tamai, Yoshin; Hosogai, Takeo; Fujita, Yoshiji; and Itoi, Kazuo, 3,981,930.

Nino, Guillermo J.: *See—*
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Nippon Electric Company, Ltd.: *See—*
Mitsuhashi, Sadayuki; Suzuki, Norio; and Nago, Kazuyoshi, 3,982,216.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Kogaku K.K.: *See—*
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Ohmori, Sachio; and Kimura, Shuji, 3,982,256.

Nippon Paint Co., Ltd.: *See—*
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Nippon Toki Kabushiki Kaisha: *See—*
Kojima, Yasuhiro; Matunaga, Niiti; and Nawa, Motoki, 3,981,761.

Nischk, Gunther: *See—*
Radlmann, Eduard; Schaffner, Heinz; Lorenz, Gunter; and Nischk, Gunther, 3,981,842.

Nishida, Takashi; Ninagawa, Yoichi; Omura, Yoshiaki; Mori, Fumio; Tamai, Yoshin; Hosogai, Takeo; Fujita, Yoshiji; and Itoi, Kazuo, to Kuraray Co., Ltd. Diacetylene diol derivatives and process for preparing the same. 3,981,930, Cl. 260-635.00Y.

Nishikido, Joji: *See—*
Fukuoka, Yohei; Kato, Toshio; Imai, Norio; Nishikido, Joji; Hamada, Masato; Mikami, Hiroshi; Iwasaki, Hirohumi; and Koike, Toshihisa, 3,981,906.

Nishioka, Toshio: *See—*
Hirano, Masachika; Ohno, Isao; Okuno, Yoshitoshi; Magara, Osamu; Itaya, Nobushige; Nishioka, Toshio; Mizutani, Toshio; Ohno, Nobuo; Matsuo, Takashi; and Takeda, Hisami, 3,981,903.

Niswender, Gordon Dean; and Hudson, James M., to Micromedic Diagonistics, Inc. Cyanocobalamin derivatives. 3,981,863, Cl. 536-25.000.

Nittel, Herman: *See—*
Redmer, Wilbert; Rolin, Kenneth; and Nittel, Herman, 3,981,956.

Nitto Electric Industrial Co., Ltd.: *See—*
Yamamoto, Katsumi; Fujimori, Masahiro; Fujinawa, Masahiro; and Sonoda, Sanenobu, 3,981,074.

Nobinger, Louis C. Apparatus for bending conduits. 3,981,173, Cl. 72-389.000.

Noguchi, Masaaki; Bunda, Tsuchio; and Sumiyoshi, Masaharu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for purifying exhaust gases by catalytic reaction. 3,981,145, Cl. 60-288.000.

Nordson Corporation: *See—*
Scholl, Charles H., 3,981,416.
Nordstrom, Harold A.: *See—*
Bahoshy, Bernard J.; Klose, Robert E.; and Nordstrom, Harold A., 3,982,023.
Norlin Music, Inc.: *See—*
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Normac, Inc.: *See—*
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North Hills Electronics, Inc.: *See—*
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Northrop Corporation: *See—*
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Nosek, Thaddeus W., to Borg-Warner Corporation. Self-contained multiplate wet clutch. 3,981,381, Cl. 192-70.180.
Nuclear Power Company (Whetstone) Limited: *See—*
Middleton, John Ernest, 3,981,770.
Nugarus, Anthony R., to Restaurant Technology, Inc. Anti-stick grill. 3,981,233, Cl. 99-422.000.
Numata, Yukio: *See—*
Saikaishi, Noboru; Numata, Yukio; Takahashi, Tetsuo; Kumagai, Morio; and Naito, Michinori, 3,982,198.
Nunziato, Charles. Golf club head construction. 3,981,507, Cl. 273-164.000.
Nurminen, John I.; and Sturgis, David H., to Howmet Corporation. Metal casting mold with bonded particle filter. 3,981,352, Cl. 164-358.000.
Nutley, Paul John: *See—*
McDowell, John David, Jr.; and Nutley, Paul John, 3,981,421.
N.V. Chefaro Maatschappij: *See—*
van Holten, Jan; and Ribbens, Cornelis, 3,981,926.
Nyman, Frederick Russell; Vossen, John Louis, Jr.; Fisher, Dennis Glendon; and Nichols, George Frederick, to RCA Corporation. Metal coating for video discs. 3,982,066, Cl. 178-6.60R.
Obata, Shizuo; Yamato, Yukiomi; and Taniguchi, Hitoshi, to Fuji Oil Company, Ltd. Method of manufacturing edible soy protein-containing, simulated meat product. 3,982,004, Cl. 426-641.000.
Oborn, Robert Edward, to Procter & Gamble Company, The. Egg white composition. 3,982,040, Cl. 426-614.000.
Oce-van der Grinten N.V.: *See—*
Kratcoski, Francis L.; and Brahos, William, 3,982,094.
Ochiai, Minoru: *See—*
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Ochiai, Sadamasa. Method for detecting liquid leak and a cable therefor. 3,981,181, Cl. 73-40.50R.
Odier, Marc G. Puzzle with irregular pentagonal pieces. 3,981,505, Cl. 273-157.00R.
O'Donovan, Michael Valentine: *See—*
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Oelschlager, Herbert; Matthiesen, Uwe; and Behrendt, Wilhelm A., to Temmler Werke-Vereinigte Chemische Fabriken. Analgesic compositions comprising 1H- or respectively 2H-indazolone-3 (β-morpholino-alkoxy) compounds. 3,981,997, Cl. 424-248.000.
Oetiker, Hans. Clamping device with tightening device. 3,981,049, Cl. 24-20.0TT.
Offermanns, Heribert; and Posselt, Klaus, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Sulfur containing trialkoxybenzoylamino carboxylic acids. 3,981,910, Cl. 260-516.000.
Ogata, Yasuhiro: *See—*
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Ogawa & Co., Ltd.: *See—*
Fujita, Masao; Akiyama, Takuya; Saeki, Yoshito; and Ueno, Yasuhiko, 3,981,889.
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Ogden, Dennis H., to British Industrial Plastics Limited. Vehicle retardation. 3,981,602, Cl. 404-71.000.
Ogura, Iwao: *See—*
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Oh, Chan Soo; and Hsieh, Paul Y., to Timex Corporation. Liquid crystal electro-optical display. 3,981,558, Cl. 350-160.0LC.
Ohi, Akira: *See—*
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Ohmori, Sachio; and Kimura, Shuji, to Nippon Kogaku K.K. Rotary shutter blade mechanism for cameras. 3,982,256, Cl. 354-253.000.
Ohno, Isao: *See—*
Hirano, Masachika; Ohno, Isao; Okuno, Yoshitoshi; Magara, Osamu; Itaya, Nobushige; Nishioka, Toshio; Mizutani, Toshio; Ohno, Nobuo; Matsuo, Takashi; and Takeda, Hisami, 3,981,903.
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Oiler, Philip R., to Hehr International Inc. Method of splicing and products thereof. 3,981,067, Cl. 29-522.000.
Okada, Kazuo: *See—*
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Okada, Ryuzo; Nagashima, Toshio; Kito, Hidetoshi; Tsukamoto, Takuzo; Nakaguchi, Michiharu; and Handa, Kenichi, to Fuji Xerox Co., Ltd. Magnetic brush type developer for use in an electrophotographic machine. 3,981,271, Cl. 118-637.000.
Okai, Sakuo: *See—*
Tsuchida, Shozo; and Okai, Sakuo, 3,981,583.
Okamoto, Takehiko; Kishimoto, Akihiko; Nagai, Ikuo; Sato, Hiroshi; Okasaka, Hotsuma; and Inoue, Masakazu, to Toray Industries, Inc. Method for producing impact resistant thermoplastic resin by continuous bulk polymerization. 3,981,944, Cl. 260-880.00R.
Okasaka, Hotsuma: *See—*
Okamoto, Takehiko; Kishimoto, Akihiko; Nagai, Ikuo; Sato, Hiroshi; Okasaka, Hotsuma; and Inoue, Masakazu, 3,981,944.
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Okazaki, Isao: *See—*
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Okuno, Yoshitoshi: *See—*
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Olivieri, Daniel; and Socci, Robert James, to RCA Corporation. Heat spreader and low parasitic transistor mounting. 3,982,271, Cl. 357-81.000.
Olliffe, David William. Centrifuges. 3,982,162, Cl. 318-313.000.
Olschewski, Armin: *See—*
Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 3,981,610.
Olson, Albert T.: *See—*
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Olson, Richard O.; and Pohto, Gerald R., to Diamond Shamrock Corporation. Dimensionally stable anode and method and apparatus for forming the same. 3,981,790, Cl. 204-286.000.
Olthoff, Klaas, to Alfa-Laval N.V. Stirring apparatus for a liquid tank. 3,981,315, Cl. 134-167.00R.
Omura, Takayoshi: *See—*
Habu, Teiji; Yamaguchi, Hisashi; Wada, Tsuneo; Sasaki, Takashi; Ishii, Hiroki; Omura, Takayoshi; and Inokuma, Hiroyuki, 3,981,857.
Omura, Yoshiaki: *See—*
Nishida, Takashi; Ninagawa, Yoichi; Omura, Yoshiaki; Mori, Fumio; Tamai, Yoshin; Hosogai, Takeo; Fujita, Yoshiji; and Itoi, Kazuo, 3,981,930.
Onal, Hasan F., to Sundstrand Corporation. Down hole pump and method of deep well pumping. 3,981,626, Cl. 417-89.000.
Oneto, Miguel Maximo. Preservation of alcoholic beverages. 3,982,024, Cl. 426-15.000.
Ono, Yuichi: *See—*
Ito, Kazuhiro; Kawamura, Masao; Ono, Yuichi; and Morioka, Makoto, 3,981,764.
Optical Coating Laboratory, Inc.: *See—*
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Optical Sciences Group: *See—*
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Orimo, Katsumi: *See—*
Shimano, Takashi; Orimo, Katsumi; Yamamoto, Shoji; and Azuma, Masao, 3,981,649.
Orlando, Carl, to United States of America, Army. Image stabilization system. 3,982,255, Cl. 354-70.000.
Orlowski, Gerald J. Molding apparatus and method. 3,982,035, Cl. 426-454.000.
Orsma, Tauno: *See—*
Turunen, Lasse Juhani; Rimpinen, Heikki; Orsma, Tauno; and Peurala, Aimo, 3,981,121.
Orso, Francis L.; and Piazza, Giacomo J., to Corning Glass Works. In-line homogenizing of extrudable ceramic batch materials. 3,981,657, Cl. 425-198.000.
Ort, Jay E., to ERA, Incorporated. High quality methane gas through modified anaerobic digestion. 3,981,800, Cl. 210-6.000.
Osada, Isao: *See—*
Yamamoto, Sadanori; and Osada, Isao, 3,981,840.
Oslapas, Raymond; and Herrin, Thomas Raymond, to Abbott Laboratories. Radioimmunoassay for determining the digoxin content of a sample. 3,981,982, Cl. 424-1.500.
Ostermann, Max, to W. & M. Ostermann. Braiding machine. 3,981,223, Cl. 87-50.000.

Osterreichisch-Amerikanische Magnesit Aktiengesellschaft: *See—*
Pletzer, Fridolin; Strasser, Hubert; and Tschernuth, Hans, 3,981,950.
Otani, Yasuhiko; and Imada, Setsuo, to Kobe Steel Ltd. Method of rotational molding reinforcer-incorporated plastics. 3,981,955, Cl. 264-255.000.
Otsuka, Shinjiro: *See—*
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Owens-Illinois, Inc.: *See—*
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Johnson, John R., 3,981,710.
Lovalenti, Sam; and Riggs, Darius O., 3,981,180.
Ownby, James C., to Eastman Kodak Company. Novel combinations of ultraviolet stabilizers and their use in organic compositions. 3,981,822, Cl. 252-403.000.
Oya, Akiyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Key assigner. 3,981,217, Cl. 84-1.030.
Oyaba, Takashi: *See—*
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Pace, Gerald F.; Stauter, John C.; Armstrong, Calvin N.; and Harris, Gary R., to Continental Oil Company. Electrolysis process and apparatus. 3,981,784, Cl. 204-105.00R.
Padgett, Clarence W.: *See—*
Luisi, James A.; Padgett, Clarence W.; and Street, Dana C., 3,982,138.
Page, Robert E., to Beloit Corporation. Melt blowing intermixed filaments of two different polymers. 3,981,650, Cl. 425-72.00S.
Pako Corporation: *See—*
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Pangle, James C., Jr.; and Hicks, Alton D., to Dan River Inc. Yarn sizes, sizing treatments and resulting sized yarns. 3,981,836, Cl. 260-29.60H.
Panov, Alexandr Pavlovich: *See—*
Antonets, Ivan Vasilievich; Mlynchik, Igor Kasianovich; and Panov, Alexandr Pavlovich, 3,982,275.
Panzarella, John E.: *See—*
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Papa, Anthony Joseph; and Proops, William Robert, to Union Carbide Corporation. Polyurethanes containing brominated cycloaliphatic ester polyols. 3,981,827, Cl. 260-2.5AN.
Papalos, John G.; and Lee, James S., to Diamond Shamrock Corporation. Large particle size synthetic latex emulsifiers. 3,981,837, Cl. 260-29.7SQ.
Papoff, Paolo; and Morelli, Basilio, to Consiglio Nazionale delle Ricerche. Device for mixing liquids in kinetic reactions observed by the method known as stopped flow. 3,981,487, Cl. 259-4.00R.
Pappas, George: *See—*
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Parker, Elmo G., to Rohr Industries, Inc. Method for plated foil liquid interface diffusion bonding of titanium. 3,981,429, Cl. 228-194.000.
Partridge, William T.: *See—*
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Patel, Kanu I., to Redken Laboratories, Inc. Hair waving method with a prebonder. 3,981,312, Cl. 132-7.000.
Patton, Bobbie Joe, to Mobil Oil Corporation. Method and apparatus for transmitting downhole information from a well. 3,982,224, Cl. 340-18.0NC.
Patton, John T., Jr.: *See—*
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Patzke, Robert C.: *See—*
Jesensky, Alexander; Meller, Frederick D.; Patzke, Robert C.; and Willey, Gilbert W., 3,981,574.
Pauling, Horst, to Hoffmann-La Roche Inc. Phenylsiloxy vanadium oxide catalysts. 3,981,896, Cl. 260-429.00R.
Pautsch, Gunthard: *See—*
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Pavlik, Frank J., to Minnesota Mining and Manufacturing Company. Perfluorotertiaryalkyl ethers. 3,981,928, Cl. 260-615.00F.
Payne, Charles C.: *See—*
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Pazmany, Ladislao, to Rohr Industries, Inc. Overwing thrust reverser. 3,981,463, Cl. 244-110.00B.
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Pease, Henry E.: *See—*
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Pechhold, Engelbert, to Du Pont de Nemours, E. I., and Company. Method of controlling fungi and bacteria in paper products. 3,981,766, Cl. 162-161.000.
Pedder, David John: *See—*
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Pelse, Igor A.: *See—*
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Penrod, John K., to Power Management Corporation. Arc suppressor circuit. 3,982,137, Cl. 307-136.000.
Perkin-Elmer Corporation, The: *See—*
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Rosenkrantz, L. Jay; Rowley, Robert S.; and Schroeder, John B., 3,982,201.
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Perkins, Joseph R., to AMF Incorporated. Optical system to optimize field of view uniformity in a multi-color produce sorter. 3,981,590, Cl. 356-178.000.
Perl, Richard L., to Tappan Company, The. Control circuit and adjustable valve for a gas appliance. 3,981,674, Cl. 431-67.000.
Perner, Johannes: *See—*
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Perruzzi, John E. Spiral, tapered-land, journal bearing. 3,981,547, Cl. 308-98.000.
Persson, Russell C. High visibility dial indicator. 3,981,266, Cl. 116-129.00F.
Peters, Edwin E.: *See—*
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Petersen, Egon; Schmidt, Werner; and Steffen, Klaus-Dieter, to Dynamit Nobel Aktiengesellschaft. Method for the preparation of bis-(bromomethyl)-tetrachlorobenzenes and their use as flame-proofing agents. 3,981,936, Cl. 200-651.00R.
Peterson, David Cartwright: *See—*
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Peterson, Gary D.: *See—*
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Petree, Harris E.; and Stutts, Joseph W., to Ciba-Geigy Corporation. Treatment of iron deficiencies in plants with iron complexes of ethylene-bis-(α-imino-2-hydroxyaryl acetic acids). 3,981,712, Cl. 71-1.000.
Petrini, Guido: *See—*
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Phillipps, Gordon H.; Bain, Brian M.; and Clark, John C., to Glaxo Laboratories Limited. Chemical compounds. 3,981,894, Cl. 260-397.100.
Phillips, Bobby M., to Eastman Kodak Company. Arrangements in spinnerets of spinning orifices having significant kneeing potential. 3,981,948, Cl. 264-40.700.
Phillips, Carmen S.; and Mecklin, Charles D., to International Harvester Company. Belt tracking system for a baler. 3,981,391, Cl. 198-308.000.
Phillips, Peter J. Direct-dial combination lock. 3,981,167, Cl. 70-311.000.
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Pitman, Herbert J.: *See—*
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Pittet, Alan O.: *See—*
Slangan, Gary; Pittet, Alan O.; Giacino, Christopher; Hruza, Denis E., Sr.; and Shuster, Edward J., 3,982,009.

Pizzini, Louis C.: *See—*
Demou, John G.; Pizzini, Louis C.; and Patton, John T., Jr., 3,981,828.

Plattier, Marcel: *See—*
Celli, Charles Jerome Louis; Plattier, Marcel; and Teisseire, Paul Jose, 3,981,891.

Pletzer, Fridolin; Strasser, Hubert; and Tschernuth, Hans, to Osterreichisch-Amerikanische Magnesit Aktiengesellschaft. Method for production of cement-bonded molded articles particularly lightweight fiber boards. 3,981,950, Cl. 264-109.000.

Plueddemann, Edwin P., to Dow Corning Corporation. Primer compositions. 3,981,851, Cl. 526-267.000.

Pogoretsky, Vitaly Vasilievich: *See—*
Medovar, Boris Izrailevich; Saenko, Vladimir Yakovlevich; Schupak, Grigory Bentsionovich; Alferov, Jury Fedorovich; Karpov, Vladimir Fedorovich; Berman, Kirill Adolfovich; Pogoretsky, Vitaly Vasilievich; Ovseichuk, Vitaly Alexandrovich; Zabolotsky, Petr Stepanovich; Boiko, Georgy Alexandrovich; Oleinik, Vladimir Ivanovich; Grodzitsky, Stanislav Vitalievich; Popov, Viktor Andreevich; and Chvertko, Anatoly Ivanovich, 3,981,349.

Pohto, Gerald R.: *See—*
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Poletto, John Frank: *See—*
Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 3,981,868.

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Porta, Augusto: *See—*
Doniat, Denis; Porta, Augusto; and Bugnet, Bernard, 3,981,747.

Porter, Joseph W., to General Electric Company. High-voltage electric circuit breaker comprising series-connected vacuum interrupter and fluid blast interrupter. 3,982,088, Cl. 200-144.00B.

Portz, William E., to True Temper Corporation. Yoke for game racket. 3,981,502, Cl. 273-73.00G.

Posselt, Klaus: *See—*
Offermanns, Heribert; and Posselt, Klaus, 3,981,910.

Post Office, The: *See—*
Jefferis, Alan Kenneth; and Hodson, Kevin, 3,982,075.

Potter, Stannard M., to Horn Construction Co., Inc. Muffler for pile driving apparatus. 3,981,378, Cl. 181-50.000.

Potts, Robert G. Cone labeling, separating and restacking apparatus and method. 3,981,407, Cl. 214-8.50E.

Poujois, Robert, to Commissariat a l'Energie Atomique. Differential voltage amplifier. 3,982,196, Cl. 330-9.000.

Poulsen, Peter D., to General Dynamics Corporation. System for protection from laser radiation. 3,982,206, Cl. 331-94.50T.

Poverenny, Alexandr Mikhailovich; Semin, Jury Alexeevich; Chumakov, Mikhail Petrovich; Gagarina, Antonina Vasilievna; Khanina, Maria Kronidovna; Tkachenko, Evgeny Alexandrovich; and Bashkirtsev, Vyacheslav Nikolaevich. Method of attenuating viruses with simultaneous stabilization of their antigens using selected aminomethylol compounds. 3,981,772, Cl. 195-1.400.

Powell, James E., to Shell Oil Company. 2-(5,6-Dihydro-4H-1,3-thiazin-2-yl)-2-nitroethenamine insect control agents. 3,981,871, Cl. 260-243.00R.

Power Management Corporation: *See—*
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Prescott, Robert C., to Foxboro Company, The. Pneumatic output signal limiting device. 3,981,318, Cl. 137-86.000.

Prestegaard, Paul G. Blank feeder apparatus. 3,981,494, Cl. 271-10.000.

Princeton Polymer Laboratories, Incorporated: *See—*
Hudgin, Donald E.; and Zawadzki, Thomas, 3,981,856.

Prior, Barry W.; and Halkola, John T., to Rohr Industries, Inc. Fan cascade thrust reverser. 3,981,451, Cl. 239-265.310.

Procter & Gamble Company, The: *See—*
McDowell, John David, Jr.; and Nutley, Paul John, 3,981,421.
Munro, Hamish David, 3,981,826.
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Proeschl, Bernard E.; Schell, Ralph C.; and Stanley, James M., to Caterpillar Tractor Co. Wagon door control system and dual cam therefor. 3,981,539, Cl. 298-35.00M.

Proops, William Robert: *See—*
Papa, Anthony Joseph; and Proops, William Robert, 3,981,827.

Prugh, John D., to Merck & Co., Inc. 1-Alkyl-4-(10[1-piperidyl]-5H-dibenzo-[a,d]cycloheptene-5-ylidene)piperidine compounds. 3,981,876, Cl. 260-293.620.

Prugh, John D., to Merck & Co., Inc. Piperidylidene derivatives of carboxy-5H-dibenzo[a,d]cycloheptene. 3,981,877, Cl. 260-293.620.

Przybylla, Fritz, to Werner & Pfleiderer. Method for crack-free joining of tubes for a wearing insert for screw conveyors. 3,981,428, Cl. 228-175.000.

Pulling, Nathaniel H., to Liberty Mutual Insurance Company. Vehicle restraint system. 3,981,518, Cl. 280-730.000.

Pulling, Nathaniel H., to Liberty Mutual Insurance Company. Protective enclosure for passengers of transport devices. 3,981,520, Cl. 280-748.000.

Pullman Incorporated: *See—*
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Pulp and Paper Research Institute of Canada: *See—*
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Purdy, Paul D.: *See—*
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Queisser, Hans-Joachim: *See—*
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Quinn, Robert Leon: *See—*
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Quintana, Michael A., to Malden Mills, Inc. Textile package. 3,981,400, Cl. 206-407.000.

R. W. Mac Company: *See—*
MacDonnell, Robert W.; and Shander, Otto A., 3,981,548.

Radlmann, Eduard; Schaffner, Heinz; Lorenz, Gunter; and Nischk, Gunther, to Bayer Aktiengesellschaft. Substantially non-inflammable acrylonitrile polymers containing antimony salts. 3,981,842, Cl. 260-45.75B.

Ramich, Gary Allen, to American Can Company. Easy opening carton for frozen comestible. 3,981,434, Cl. 229-51.0TS.

Ramsdale, Roy, to Alex L. Clark Limited. Slide frame. 3,981,092, Cl. 40-158.00R.

Ramsey, Derald D.: *See—*
Thorud, Richard A.; Wood, William D.; and Ramsey, Derald D., 3,982,082.

Rao, Ganta Venkateswara; Garinger, Dale Albert; and Shoup, Floyd Kent, to United States of America, Agriculture. Gluten washing and dewatering device. 3,981,738, Cl. 127-25.000.

Rapparlie, Hans: *See—*
Klappenecker, Karl; Burkhardt, Gisbert; and Rapparlie, Hans, 3,981,493.

Rasmussen, Howard J.: *See—*
Rutili, Renzo N.; and Rasmussen, Howard J., 3,981,470.

Ratony, Alexander, to Starr, Robert N. Staggered channel wing-type aircraft. 3,981,460, Cl. 244-13.000.

Ratowsky, Simon, to Monrick Holdings Limited. Carrier for processing photographic material and apparatus for rotating the carrier. 3,981,488, Cl. 259-72.000.

Rau, Eric: *See—*
Lobunez, Walter; Kim, Nam Kyun; and Rau, Eric, 3,981,686.

Rauch, Philippe; and Tinchon, Jacques, to Teleco Inc. Device for blocking at a given torque a rotating machine driven by a hydraulic turbine. 3,981,186, Cl. 73-151.000.

Raudenbusch, Werner Theodor: *See—*
Algieri, Salvatore; Weiss, Jonas; and Raudenbusch, Werner Theodor, 3,981,954.
Rausing, Gad A., to Sobrefina SA. Package intended for pressurized contents. 3,982,029, Cl. 426-106.000.
Rautiola, Norman A.: *See—*
Bull, Dale L.; and Rautiola, Norman A., 3,982,122.
Ray, Ranjan; and Musso, Elisabeth, to Allied Chemical Corporation. Amorphous alloys in the U-Cr-V system. 3,981,722, Cl. 75-122.700.
Raymond Lee Organization, Inc., The: *See—*
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Brooks, Susie C., 3,981,032.
Christensen, Gordon R., 3,981,063.
Cooperstein, Norman, 3,982,084.
Johnson, Allen M. L., 3,981,029.
McCroskey, George A., Sr., 3,981,037.
Minnick, Jim N., 3,981,295.
Siegel, Joseph, 3,981,028.
Thomas, Vaughn, 3,982,118.
Raynolds, Stuart, to Du Pont de Nemours, E. I., and Company. Durable textile treating adducts. 3,981,807, Cl. 252-8.800.
Raytheon Company: *See—*
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RCA Corporation: *See—*
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Heyman, Philip Michael; Quinn, Robert Leon; and Gorog, Istvan, 3,981,560.
Horsley, James Othel, 3,982,108.
Lo, Gerald Joy-Pak; Papworth, Francis Leo; Tenne-Sens, Nicolas Elmars; O'Donovan, Michael Valentine; and Dziub, Gerald, 3,982,215.
Nyman, Frederick Russell; Vossen, John Louis, Jr.; Fisher, Dennis Glendon; and Nichols, George Frederick, 3,982,066.
Olivieri, Daniel; and Socci, Robert James, 3,982,271.
Saulnier, Theodore Alexander, 3,981,729.
Schade, Otto Heinrich, Jr., 3,982,197.
Todd; Clinton Harvey, 3,981,554.
Yocom, Perry Niel; and Dismukes, John Pickett, 3,981,819.
Reagan, William J., and Chen, Nai Y., to Mobil Oil Corporation. Hydrocarbon conversion catalyst. 3,981,825, Cl. 252-455.00R.
Reaux, James R.: *See—*
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Redken Laboratories, Inc.: *See—*
Patel, Kanu I., 3,981,312.
Redman, Charles. Electric device for processing signals in three dimensions. 3,982,147, Cl. 313-309.000.
Redmer, Wilbert; Rolin, Kenneth; and Nittel, Herman, to Abbott Laboratories. Continuous automated plastic molding method. 3,981,956, Cl. 264-275.000.
Reed, Charles Paul, to Alcan Aluminum Corporation. Sheathing system for building structures. 3,981,116, Cl. 52-484.000.
Reed, Frederick P., to United States of America, America. Gas operated launcher. 3,981,093, Cl. 42-1.00F.
Reed, Homer Charles: *See—*
Coad, Peter; Murray, Edward Conley; and Reed, Homer Charles, 3,981,974.
Reedy, Charles E.; and Carlson, Edwin S., to ACF Industries, Incorporated. Bottom operable tank car valve. 3,981,481, Cl. 251-144.000.
Rees, John Michael: *See—*
Mason, David Robert; Cole, Susan Margaret; Rees, John Michael; and Coaton, James Richard, 3,982,046.
Regelson, Ephraim: *See—*
Krey, John F.; Regelson, Ephraim; and Crecelius, John D., 3,981,449.
Rehak, Dale J., to United States of America, Army. Digital pressure/range transducer. 3,982,219, Cl. 338-96.000.
Reiff, Helmut: *See—*
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Reis, James J.: *See—*
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Rembold, Heinz: *See—*
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Renner, Alfred, to Ciba-Geigy AG. High surface area polycondensation polymer particulates based on urea and formaldehyde. 3,981,845, Cl. 260-69.00R.
Restaurant Technology, Inc.: *See—*
Nugarus, Anthony R., 3,981,233.
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Hartmann, Werner; Queisser, Hans-Joachim; Markewitz, Gregor; Rettenmaier, Ulli; Sprater, Gunter; and Kniep, Rudiger, 3,982,127.
Reunanen, Matti Antero. Method of radioimmunoassay employing diffusion. 3,981,981, Cl. 424-1.500.
Reverberi, Leo. Waterproof garment of reduced cumbersomeness. 3,981,026, Cl. 2-1.000.
Reynolds, David E., to Continental Oil Company. Pressure-operated switch. 3,982,217, Cl. 335-207.000.
Reynolds, Gordon S.: *See—*
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Reynolds Metals Company: *See—*
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Rhodes, John M. Plastic rotary printing screens construction method therefor. 3,981,237, Cl. 101-128.200.
Rhone-Poulenc S.A.: *See—*
Chabardes, Pierre; Gandilhon, Pierre; Grard, Charles; and Thiers, Michel, 3,981,900.
Ribbens, Cornelis: *See—*
van Holten, Jan; and Ribbens, Cornelis, 3,981,926.
Rice, Richard M., to Reynolds Metals Company. Hydraulic cascade drive system. 3,981,149, Cl. 60-424.000.
Rich, Leonard G., to Gerber Scientific Instrument Company, The. Apparatus for digitizing and plotting. 3,982,165, Cl. 318-568.000.
Richard, Byron G., to Gates Rubber Company, The. Conveying belt. 3,981,390, Cl. 198-844.000.
Richardson, Alexander Laidlaw, to International Telephone and Telegraph Corporation. Digital signal detector. 3,981,440, Cl. 235-92.0FQ.
Richardson, John G., to Harshaw Chemical Company, The. Crystal growth in the presence of finely divided polytetrafluoroethylene. 3,981,973, Cl. 423-265.000.
Richings, John Graham: *See—*
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Richman, Seymour I., to Rochester Button Company. Decorative rod making. 3,981,951, Cl. 264-140.000.
Richter, Edward K.: *See—*
Jupa, Edward C.; Meeder, Raymond L.; and Richter, Edward K., 3,982,133.
Richter, Sidney B., to Velsicol Chemical Corporation. Insecticidal compositions containing trifluoromethyl ureas and method of controlling insects using said compositions. 3,982,019, Cl. 424-322.000.
Ricoh Co., Ltd.: *See—*
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Riecker, Johann G.: *See—*
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Riegel Textile Corporation: *See—*
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Rieser, Elmer P.: *See—*
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Riggs, Darius O.: *See—*
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Riiber, Odd, to Dyno Industrier A.S. Method for drying trinitrotoluene. 3,981,934, Cl. 260-645.000.
Rilling, Ulrich: *See—*
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Rimpinen, Heikki: *See—*
Turunen, Lasse Juhani; Rimpinen, Heikki; Orsma, Tauno; and Peurala, Aimo, 3,981,121.
Ring, David F., to Kimberly-Clark Corporation. Low density tampon of intermeshed deformable strip material and inserter therefor. 3,981,305, Cl. 128-285.000.
Rinio, Johannes Augustus. Cable hauling device. 3,981,483, Cl. 254-76.000.
Ripperger, Eugene A.: *See—*
Briggs, William R.; and Ripperger, Eugene A., 3,982,057.
Risse, John T.; and Taggart, James C., to United States of America, Energy Research and Development Administration. Vehicle fuel system. 3,981,321, Cl. 137-255.000.
Ritter, Edmond Jean: *See—*
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Riviana Foods Inc.: *See—*
Steen, Gary J.; Bedell, Terrence A.; and Myers, Frank W., 3,982,041.
Rixson-Firemark, Inc.: *See—*
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Roberts, Edward David, to U.S. Philips Corporation. Positive-working electron resists. 3,981,985, Cl. 427-43.000.
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Jones, Lloyd R.; and Roberts, Frederick W., deceased, 3,981,178.
Robertshaw Controls Company: *See—*
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Robertson, Penrose David, to Westrex Limited. Spooling arrangements for endless band material. 3,981,571, Cl. 352-125.000.

Robinson, Bernie E.; and Robinson, Daniel T., to Milwaukee Valve Company, Inc. Tank truck vent system. 3,981,325, Cl. 137-587.000.

Robinson, Daniel T.: *See—*
Robinson, Bernie E.; and Robinson, Daniel T., 3,981,325.

Robinson, Thomas C., to Searle Cardio-Pulmonary Systems Inc. Respiratory humidifier. 3,982,095, Cl. 219-273.000.

Rochester Button Company: *See—*
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Rockwell International Corporation: *See—*
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Roder, Frederick L., to United States of America, Army. Method and apparatus for providing height variation compensation in certain nuclear gauging applications including nuclear mine detection. 3,982,125, Cl. 250-253.000.

Rodriguez, Juan A.: *See—*
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Rogers, Lawrence W., to Monsanto Company. Single pin guide traverse. 3,981,458, Cl. 242-43.00R.

Rogers, Peter H.; and Zalesak, Joseph F., to United States of America, Navy. Directional low-frequency ring hydrophone. 3,982,144, Cl. 310-9.600.

Rohm GmbH: *See—*
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Hilbig, Jack H., 3,981,260.
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Rolock Incorporated: *See—*
Jones, Lloyd R.; and Roberts, Frederick W., deceased, 3,981,178.

Romankiw, Lubomyr T., to IBM. Stable emulsion and method for preparation thereof. 3,981,844, Cl. 252-62.520.

Rood, Leonard D.; and Kissell, Ronald E., to Owens-Corning Fiberglas Corporation. Apparatus for producing fiber reinforced organic foam. 3,981,654, Cl. 425-115.000.

Roof, Lewis B., to Phillips Petroleum Company. Fluid detecting system. 3,981,179, Cl. 73-61.10C.

Roos, Axel Sven Olof; Faber, Kurt Heinrich Albert Erich; and Wirfelt, Sven Axel Olof, to Sandvik Aktiebolag. Cutting insert and cutting tool. 3,981,058, Cl. 29-96.000.

Roos, Jan, to U.S. Philips Corporation. Method of copying magnetic recordings provided on a magnetizable medium having a greater coercive force before than after recording. 3,982,276, Cl. 360-17.000.

Rosales, Louis A.: *See—*
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Rosborough, Dean E., to Caterpillar Tractor Co. Movable step of a vehicle. 3,981,515, Cl. 280-166.000.

Rosen, Marvin: *See—*
Di Bella, Eugene P.; Keyworth, Donald A.; and Rosen, Marvin, 3,981,806.

Rosenkrantz, L. Jay; Rowley, Robert S.; and Schroeder, John B., to Perkin-Elmer Corporation, The. CW solid state laser. 3,982,201, Cl. 331-94.50P.

Ross, Thomas D.; and Owen, Samuel S., to United States of America, Army. Infrared suppressor. 3,981,143, Cl. 60-264.000.

Rosvold, Warren C., to Signetics Corporation. Vacuum sputtering apparatus. 3,981,791, Cl. 204-298.000.

Roto-Finish Company: *See—*
Balz, Gunther W., 3,981,693.

Rousar, Ivo; Cezner, Vaclav; Franz, Milan; and Matusek, Miroslav, to Vyzkumny Ustav Anorganicke Chemie. Apparatus for decomposing alkali metal amalgams. 3,981,490, Cl. 266-169.000.

Rouse, David Michael; and Sproule, Betty Ann, to Bell Telephone Laboratories, Incorporated. Combinational logic arrangement. 3,982,229, Cl. 340-172.500.

Roussel-UCLAF: *See—*
Chazan, Jean Bernard; Coussediere, Daniel; and Gasc, Jean-Claude, 3,981,861.

Rouviere, Rene: *See—*
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Rowley, Robert S.: *See—*
Rosenkrantz, L. Jay; Rowley, Robert S.; and Schroeder, John B., 3,982,201.

Rozema, Arthur L.; Van Benthuysen, John D.; and Zdanys, John, to CTS Corporation. Variable resistance control. 3,982,220, Cl. 338-174.000.

Rubino, Andrew M., to Armour Pharmaceutical Company. Zirconium-aluminum-polyol buffered anti-perspirant complexes. 3,981,986, Cl. 424-47.000.

Ruddell, James Nelson; and McMeekin, Samuel, to Lambeg Industrial Research Association. Fibrous materials. 3,981,952, Cl. 264-147.000.

Ruel, Bernard George: *See—*
Lerner, Edward Mark; Peterson, David Cartwright; Quin, Terrence Thomas; and Ruel, Bernard George, 3,982,111.

Ruffini, Guglielmo: *See—*
Kruger, Emilio; Ruffini, Guglielmo; Gandini, Giovanni; and Ghislandi, Franco, 3,981,765.

Rumph, Joel D., to D-J Enterprises, Inc. Portable golf ball washing device. 3,981,039, Cl. 15-21.00A.

Runge, Detlev: *See—*
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Russ, Warren K., Jr.; Hazen, George G.; and Chamberlin, Earl M., to Merck & Co., Inc. Process for preparing (1-oxo-2-phenyl, halophenyl or thienyl-2-methyl-6,7-dichloro-5-indanyloxy)acetic acid. 3,981,888, Cl. 260-332.20A.

Ruti Machinery Works Ltd.: *See—*
Schwarz, Erwin, 3,981,332.

Rutili, Renzo N.; and Rasmussen, Howard J. Molded plastic adjustable instrument panel. 3,981,470, Cl. 248-291.000.

Ryan, James Ernest; and Smale, Rodney, to Imperial Chemical Industries Limited. Method of forming a cellular article having an integral, color-intensity varied decorative pattern on its surface. 3,981,949, Cl. 264-41.000.

Ryan, Vernon L. Adjustable support apparatus. 3,981,500, Cl. 272-85.000.

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Sachs, Thomas D. Teaching machine. 3,981,087, Cl. 35-9.00A.

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Saikaishi, Noboru; Numata, Yukio; Takahashi, Tetsuo; Kumagai, Morio; and Naito, Michinori, to Trio Electronics Incorporated. Oscillators. 3,982,198, Cl. 331-27.000.

Saikawa, Isamu; Takano, Shuntaro; Takashima, Okuta; Momonoi, Kaishu; Kuroda, Seietsu; Komatsu, Miwako; Yasuda, Takashi; Kasuya, Kyoko; and Kodama, Yutaka, to Toyama Chemical Co., Ltd. Bistype penicillins and process for producing the same. 3,981,865, Cl. 260-239.100.

St. Clair, John C. Use of solar energy heat gathering and storing systems to increase farm crop yields. 3,981,151, Cl. 60-641.000.

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Saito, Masumi; Tani, Sumio; Ito, Tateo; and Kasaoka, Shigeaki, to Kurashiki Boseki Kabushiki Kaisha. Process for reducing nitrogen oxides. 3,981,971, Cl. 423-239.000.

Sakai, Tosimitu: *See—*
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Sample, Winfield, to Bell & Howell Company. Transducing methods and transducers. 3,981,198, Cl. 73-407.00R.

Sanderson, Albert E., to Inventronics, Inc. Phase different detector and display. 3,982,184, Cl. 324-83.000.

Sandler, Yehuda L., to Westinghouse Electric Corporation. Electrochemical sensor for reactive gas mixtures. 3,981,785, Cl. 204-195.00S.

Sandoz, Inc.: *See—*
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Sato, Tadao: *See—*
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Sauvanet, Maurice, to Silec-Semi-Conducteurs. Power regulating device. 3,982,175, Cl. 323-18.000.
Savage, Phillip D., to Hall Ski-Lift Company, Inc. Timing gate for ski-lifts. 3,981,248, Cl. 104-173.0ST.
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Saxholm, Rolf. Magnetically responsive, biologically active substance and associated methods and apparatus. 3,981,776, Cl. 195-103.50R.
Sayous, Leon, to Societe Nationale des Petroles d'Aquitaine. Device for emitting mechanical waves. 3,981,379, Cl. 181-118.000.
Schacht, Louis L. Inclined bedrest. 3,981,031, Cl. 5-327.00B.
Schade, Otto Heinrich, Jr., to RCA Corporation. Radiation responsive voltage dividing circuit. 3,982,197, Cl. 330-33.000.
Schaefer, Dietrich H., to Rockwell International Corporation. Phase-lock circuitry with lock indication. 3,982,190, Cl. 328-110.000.
Schaefer, James Clement, to ESB Incorporated. Method of preparing a lithium-aluminum electrode. 3,981,743, Cl. 429-218.000.
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Scherrer, Claude-Jacques; Mauleon, Jean-Louis; and Gmerek, Jean-Daniel, to Compagnie Francaise de Raffinage; and Universal Oil Products Company, part interest to each. Compositions for inhibiting the corrosion of metals. 3,981,780, Cl. 203-7.000.
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Schlein, Allen P. Positive-locking surgical clamp. 3,981,308, Cl. 128-346.000.
Schlereth, Fritz H., to General Electric Company. Recursive numerical processor. 3,982,112, Cl. 235-156.000.
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Schoeps, Knut Christian, to Atlas Copco Aktiebolag. Pneumatic vane motor. 3,981,647, Cl. 418-259.000.
Scholl, Charles H., to Nordson Corporation. Apparatus for melting and dispensing thermoplastic material. 3,981,416, Cl. 222-146.00R.
Schoon, David J., to Minnesota Mining and Manufacturing Company. Electro-optical feedback signal producing apparatus. 3,982,124, Cl. 250-237.00R.
Schotten, Alfons; Spolgen, Hermann Josef; and Rilling, Ulrich, to Eberhard Hoesch & Sohne. Plate type press filter. 3,981,802, Cl. 210-91.000.
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Schultz, Robert S. Method of making a pressure operated container for dispensing viscous products. 3,981,119, Cl. 53-37.000.
Schultz, Wilmer R. Back system for modular seating. 3,981,536, Cl. 297-444.000.
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Smith, Carl Mayn; and Tiers, George Van Dyke, to Minnesota Mining and Manufacturing Company. Silicone-compatible azo dyestuffs. 3,981,859, Cl. 260-205.000.

Smith, Charles A.; and Warren, Arthur D., to United States of America, Air Force. Droplet impact recorder. 3,981,264, Cl. 116-114.0AM.

Smith, Harry D., to Sperry Rand Corporation. Aircraft engine automatic throttle control with automatic gain programming system. 3,981,442, Cl. 235-150.200.

Smith, Lucius N. Apparatus for gathering and containerizing citrus fruit and the like. 3,981,127, Cl. 56-328.00R.

Smith, Matthew S.; and Filippi, Ernest A. Launcher arrangement for rocket powered round. 3,981,225, Cl. 89-1.818.

Smith, Peter W.; and Soong, An-Hwa, to United Technologies Corporation. Monolithic reciprocal latching ferrite phase shifter. 3,982,213, Cl. 333-31.00A.

Smith, Richard E.; and Griswold, Augustus W., to Xerox Corporation. Mag brush housing with detachable sump section. 3,981,272, Cl. 118-637.000.

Smith, Robert J. Heat transfer and conditioning unit. 3,981,291. Cl. 126-110.00R.

Smith, Ronald Eugene, to Bourns, Inc. Contact spring for variable resistance device. 3,982,221, Cl. 338-202.000.

Smith, Trevor Stanley, to Joseph Lucas Industries. Fuel control system for gas turbine engine. 3,981,141, Cl. 60-39.28R.

Smith, William A., to Raytheon Company. Cascade crossed field device. 3,982,152, Cl. 315-3.600.

Smith, William E., to General Electric Company. Diols by transesterification using magnesia catalysts. 3,981,931, Cl. 260-635.00R.

Smits-Geurts, Louisa Josephina. Pull means for slidable member for dosing device. 3,981,420, Cl. 222-505.000.

Smyres, Gary A.; Haskett, Philip R.; Scheiner, Bernard J.; and Lindstrom, Roald E., to United States of America, Interior. Decomposition leach of sulfide ores with chlorine and oxygen. 3,981,962, Cl. 423-35.000.

Snap-Tite, Inc.: *See—*
Foster, Frank L.; and Wilcox, Wayne E., 3,981,479.

Snyder, Donald H. Work stand for bicycles. 3,981,491, Cl. 269-64.000.

Sobota, John T., to Fort Howard Paper Company. Closed draw transfer system with gaseous pressure direction of web. 3,981,084, Cl. 34-123.000.

Sobrefina SA: *See—*
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Socci, Robert James: *See—*
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Societa Haliana Vetro Siv S.p.A.: *See—*
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Societe Anonyme Automobiles Citroen: *See—*
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Societe Anonyme Roure Bertrand Dupont: *See—*
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Societe Nationale des Petroles d'Aquitaine: *See—*
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Societe Nationale Industrielle Aerospatiale: *See—*
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Sokol, Gary Leo: *See—*
Feinstein, Paul, Jr.; and Sokol, Gary Leo, 3,981,497.

Sokolow, Nickolas N., to Beloit Corporation. Parison transfer means. 3,981,673, Cl. 425-455.00R.

Sola Basic Industries, Inc.: *See—*
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Solartron Electronic Group Limited, The: *See—*
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Sonnenberg, Sven: *See—*
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Sonnet, Philip E.: *See—*
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Sonoda, Sanenobu: *See—*
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Sonoyama, Yuzo: *See—*
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Soule, Hendrick H., Jr.; and Jureller, John F., to General Electric Company. Sidelobe canceller with programmable correlation signal weighting. 3,982,245, Cl. 343-100.0LE.

Sowers, Norman A.: *See—*
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Soya, Masahiro; and Kubota, Shokichi, to Tokico Ltd. Perforated plate of steam reforming valve. 3,981,946, Cl. 261-64.00R.

Spangle, Lloyd B., to Dow Chemical Company, The. Apparatus for measuring the density of a cement slurry. 3,981,202, Cl. 73-438.000.

Speed, Sidney E., to Swiss Aluminum Limited. Foaming of metal by the catalyzed and controlled decomposition of zirconium hydride and titanium hydride. 3,981,720, Cl. 75-20.00F.

Spencer, Robert, to Simon-Barron Limited. Press having torque responsive drive coupling. 3,981,665, Cl. 425-331.000.

Sperati, Carleton Angelo: *See—*
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Sperman, Jacob H. Air bearing construction. 3,981,546, Cl. 308-5.00R.

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Spitzberg, Larry, to Optical Sciences Group. Automatic objective lensometer. 3,981,589, Cl. 356-127.000.

Spolgen, Hermann Josef: *See—*
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Sprang, Alfred: *See—*
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Sprater, Gunter: *See—*
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Sprunger, James. Barrier levelling attachment. 3,981,603, Cl. 404-98.000.

Square D Company: *See—*
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Squires, Arthur M. Solid-gas heat exchange method in countercurrent contacting of gas and granular material in panel bed. 3,981,355, Cl. 165-2.000.

Stach, Kurt: *See—*
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Stadter, Josef: *See—*
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Standard Oil Company (Indiana): *See—*
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Stanley Works, The: *See—*
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Stant, Ivan H.; and Bertsch, Arville E. Motor vehicle throttle control. 3,981,207, Cl. 74-513.000.

Starbard, Raymond E. Shock absorber drive unit. 3,981,204, Cl. 74-34.000.

Stargardter, Hans; and Pilpel, Walter, to United States of America, Air Force. Hollow composite compressor blade. 3,981,616, Cl. 416-233.000.

Starr, Robert N.: *See—*
Ratony, Alexander, 3,981,460.

Staudt, Heinrich; and Hofmann, Eberhard, to Robert Bosch G.m.b.H. Fuel injection pump for internal combustion engines. 3,981,634, Cl. 417-499.000.

Stauffer Chemical Company: *See—*
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Scibelli, Gabriele E.; and Feminella, Joseph Vincent, 3,982,039.
Teach, Eugene G., 3,981,716.

Stauter, John C.: *See—*
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Stedman, James K., to United Technologies Corporation. Regenerative fuel cell. 3,981,745, Cl. 204-266.000.

Steele, John M.; Hanak, Fredric M.; Nino, Guillermo J.; and Panzarella, John E., to Dow Chemical Company, The. Method for producing dry alkyl halides. 3,981,938, Cl. 260-657.000.

Steels, Gordon; and Blore, Terence John, to Baker Perkins Holdings Limited. Moulding of high boiled sugar and like confections. 3,981,656, Cl. 425-182.000.

Steen, Gary J.; Bedell, Terrence A.; and Myers, Frank W., to Riviana Foods Inc. Hermetically sealed rice mix. 3,982,041, Cl. 426-618.000.

Steffen, Klaus-Dieter: *See—*
Petersen, Egon; Schmidt, Werner; and Steffen, Klaus-Dieter, 3,981,936.

Steffey, David R.: *See—*
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Steinkamp, Robert A.: *See—*
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Stendel, Wilhelm: *See—*
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Stevens, William H., to Atomic Energy of Canada Limited. Process for hydrogen isotope concentration between liquid water and hydrogen gas. 3,981,976, Cl. 423-580.000.
Stewart, William Edgar; and de Somer, Pierre Marie Hendrik Frans, to Stichting REGA V.Z.W. Stabilization of interferon. 3,981,991, Cl. 424-85.000.
Stichting REGA V.Z.W.: *See—*
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Storz, Werner: *See—*
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Stouthamer, Bernhard; and Kwantes, Arien, to Shell Oil Company. Dehydrogenation of alcohols to ketones. 3,981,923, Cl. 260-596.000.
Strack, Richard R., to American Optical Corporation. Method for making flexible colored fiber optic device. 3,981,706, Cl. 65-3.00A.
Strasser, Hubert: *See—*
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Street, Dana C.: *See—*
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Struttmann, Hilarius S.: *See—*
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Studtmann, George Henry: *See—*
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Sturgis, David H.: *See—*
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Stutz, Theo, to Contraves AG. System for measuring the longitudinal or angular displacement of a movable component. 3,982,106, Cl. 235-92.0GC.
Suganuma, Nobuo; Saito, Kunio; Koshimizu, Masaki; Takada, Nobuyuki; and Takamuro, Reiko, to Lion Dentifrice Co., Ltd., The. Oral preparation. 3,981,989, Cl. 424-50.000.
Sugiyama, Koichi: *See—*
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Sullivan Valve & Engineering Company: *See—*
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Sumitomo Chemical Company, Limited: *See—*
Hirano, Masachika; Ohno, Isao; Okuno, Yoshitoshi; Magara, Osamu; Itaya, Nobushige; Nishioka, Toshio; Mizutani, Toshio; Ohno, Nobuo; Matsuo, Takashi; and Takeda, Hisami, 3,981,903.
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Summo, Arthur M., to Branson Ultrasonics Corporation. Method of assembling a storage battery using vibratory energy. 3,981,759, Cl. 156-73.500.
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Sundstrom, Erik Wilhelm, to Sandvik Aktiebolag. Knife assembly. 3,981,337, Cl. 144-241.000.
Sutton, George W.; and Douglas-Hamilton, Diarmaid H., to Avco Everett Research Laboratory, Inc. Method for producing a lasable gaseous mixture for use in and operation of electron beam-sustainer stabilized carbon dioxide lasers. 3,982,205, Cl. 331-94.50G.
Sutton, George W.; and Douglas-Hamilton, Diarmaid H., to Avco Everett Research Laboratory, Inc. Combustion-electric laser. 3,982,209, Cl. 331-94.50G.
Suzuki, Katuya: *See—*
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Suzuki Motor Company Limited: *See—*
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Swales, Danvers A., to British Chrome & Chemicals Limited. Sodium sulphate compositions and their production. 3,981,964, Cl. 423-53.000.
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Szilagyi, Jane M., to Delbar Products, Inc. Mirror bracket assembly. 3,981,474, Cl. 248-487.000.
Szkrybalo, William, to Hoffmann-La Roche Inc. 2,3:4,5-Di-O-substituted gluconates. 3,981,860, Cl. 536-4.000.
Szpur, Roman. Dispensing and applicating device and production of same. 3,981,304, Cl. 128-269.000.
Taft, David D.; and Shepler, Terry H., to Ashland Oil, Inc. Backsizing carpet with hot melt composition of ethylene copolymer, atactic polypropylene and vulcanized rubber. 3,982,051, Cl. 427-207.000.
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Takahashi, Kenzi; Kouchi, Toshihiro; Kamezawa, Yasutoki; and Aizawa, Tatsuo, to Mita Industrial Company, Ltd. Diazo-type multicolor reproduction process. 3,981,730, Cl. 96-49.000.
Takahashi, Kiyoshi: *See—*
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Takahashi, Susumu, to Sansui Electric Co., Ltd. Decoding apparatus for use in matrix four channel systems of a plurality of types. 3,982,069, Cl. 179-1.0GQ.
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Takashima, Masaru, to Aikoh Co., Ltd. Method for desulfurizing molten iron. 3,981,721, Cl. 75-58.000.
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Tamai, Yoshin: *See—*
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Tamura, Masahiko; and Oyaba, Takashi, to Pioneer Electronic Corporation. Piezoelectric diaphragm electro-acoustic transducer. 3,982,143, Cl. 310-9.100.

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Tanaka, Satoru; and Watanabe, Hideaki, to Eisai Co., Ltd. 1,3-Benzodioxol derivatives. 3,981,864, Cl. 260-239.0BC.

Tanaka, Susumu; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Fujiwara, Takao; Murasaki, Hiroshi; and Wada, Kenichi, to Minolta Camera Kabushiki Kaisha. Photocopier illumination device. 3,981,575, Cl. 355-1.000.

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Taniguchi, Hitoshi: *See—*
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Tanner, Herbert: *See—*
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Tantum, James Gordon: *See—*
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Taulier, Hubert Henri Leon; and Brugeilles, Gerard, to Electricite de France (Service National). Fuse and application of said fuse to the construction of an emergency shutdown system for a nuclear reactor. 3,981,598, Cl. 403-28.000.

Taylor, Don Allen. Injection cylinder unit, mold and mold handling apparatus. 3,981,661, Cl. 425-247.000.

Taylor, Hervey, to Home Curtain Corporation. Curtain hemming device. 3,981,255, Cl. 112-155.000.

TCI, Inc.: *See—*
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Teach, Eugene G., to Stauffer Chemical Company. Gem-bis amide herbicide antidote compositions and methods of use. 3,981,716, Cl. 71-100.000.

Tee-Pak, Inc.: *See—*
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Terentiev, Viktor Petrovich: *See—*
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Termohlen, David E., to International Environmental Dynamics, Inc. Process and apparatus for supporting hoisted floors peripherally of supporting tower. 3,981,109, Cl. 52-126.000.

Tesa S.A.: *See—*
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Tessitore, Frank: *See—*
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Thermospray AG: *See—*
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Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Track working machine with vibratory and reciprocable track working tools. 3,981,247, Cl. 104-12.000.

Thiel, Max: *See—*
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Thiele, Geraldine H. Injectable solutions and processes of using such. 3,982,017, Cl. 424-318.000.

Thiers, Michel: *See—*
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Thoma, Klaus: *See—*
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Thomas, Charles Edward: *See—*
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Thomas, Roy D.; and Johnston, Ross W., to Sperry Rand Corporation. Automatic print gap adjustment arrangement. 3,981,235, Cl. 101-93.140.

Thomas, Vaughn, to Raymond Lee Organization, Inc., The, a part interest. Vehicle outside light fixture. 3,982,118, Cl. 240-7.10R.

Thompson, Morice William: *See—*
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Thompson, Russell G.: *See—*
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Mason, David Robert; Cole, Susan Margaret; Rees, John Michael; and Coaton, James Richard, 3,982,046.

Thornhill, Dewey B.; and Frank, Ralph E., Jr., to Boise Cascade Corporation. One-step easy-open container for refrigerated dough products and the like. 3,981,433, Cl. 229-51.0BP.

Thorud, Richard A.; Wood, William D.; and Ramsey, Derald D., to Toro Company, The. Starting system. 3,982,082, Cl. 200-44.000.

Thun, Niels: *See—*
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Ticker, Arthur. Non-polluting disposal of antifouling paint residues encountered in shipyard abrasive blasting operations. 3,981,252, Cl. 110-18.00R.

Tieman, Lloyd E.: *See—*
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Toda, Kooichiro, to France Bed Co. Ltd. Mattress. 3,981,033, Cl. 5-351.000.

Todd, Clinton Harvey, to RCA Corporation. Method of air letting an evacuated cathode ray tube. 3,981,554, Cl. 316-2.000.

Togashi, Shiyuichi, to Fuji Photo Optical Co., Ltd. Means for enabling stopped-down measurement in exposure control camera employing full-aperture measuring system. 3,982,257, Cl. 354-286.000.

Toivonen, Harry. Fishing lure. 3,981,096, Cl. 43-42.390.
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Tomecek, Jerry J.; and Hagerty, Philip J., to Tekonsha Engineering Company. Brake controller and short circuit probe disconnect. 3,981,544, Cl. 303-21.0AF.
Toray Industries, Inc.: *See—*
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Trostler, Richard M. Heater and control system. 3,982,098, Cl. 219-501.000.
Troy, Stephen R. Exponential sweep multivibrator. 3,982,139, Cl. 307-228.000.
Trudeau, William H.: *See—*
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True Temper Corporation: *See—*
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Trumble, Terry M., to United States of America, Air Force. Ultraviolet wavelength smoke detector. 3,982,130, Cl. 250-373.000.
TRW Inc.: *See—*
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Tsilibes, George N., to Xerox Corporation. Optical system for an electrophotographic printing machine. 3,981,577, Cl. 355-4.000.
Tsubota, Masaharu: *See—*
Yonezu, Kunio; Tsubota, Masaharu; and Asai, Kenji, 3,981,742.
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Tsukamoto, Takuzo: *See—*
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Tuccillo, Joseph J., to Pennwalt Corporation. White gold alloy. 3,981,723, Cl. 75-165.000.
Tucker, Gerald L.; and Blanton, Elmer Ladelle, to Mississippi Chemical Corporation. Urea-zinc oxide composition and process. 3,981,713, Cl. 71-28.000.
Tull Aviation Corporation: *See—*
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Turner, Clarence A. Self-centering tool holding apparatus. 3,981,211, Cl. 82-36.00R.
Turner, Jeanette A. Sunbathing accessory. 3,981,030, Cl. 5-327.00R.
Turner, Kenneth W., to Teletype Corporation. Method and apparatus for decoding diphase signals. 3,982,195, Cl. 329-50.000.
Turunen, Lasse Juhani; Rimpinen, Heikki; Orsma, Tauno; and Peurala, Aimo, to G. A. Serlachius Oy. Machine for filling a sack with piece goods and closing mouth opening of the sack. 3,981,121, Cl. 53-159.000.
TVI-Television Industrielle S.A.: *See—*
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Ueno, Yasuhiko: *See—*
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Uitti, Kenneth D., to UOP Inc. Pressurized column solvent extraction of nickel from ammoniacal solutions. 3,981,969, Cl. 423-139.000.
Ukeiley, Richard Larry, to Bell Telephone Laboratories, Incorporated. Automatic cable balancing network. 3,982,080, Cl. 179-170.00D.
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Urbanek, Edwin A.; and Teumer, Roger G., to Xerox Corporation. Photoelectrophoretic electrostatic tacking capstan web tension system. 3,981,459, Cl. 242-75.440.

Urick, Robert J., to United States of America, Navy. Deep hydrophone string. 3,982,222, Cl. 340-2.000.

USM Corporation: *See—*
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Vaiden, Henry Edge, to Bell Telephone Laboratories, Incorporated. Apparatus for testing multiconductor cables for continuity, correct connections, and the absence of short circuits between conductors. 3,982,180, Cl. 324-51.000.

Valdettaro, Alarico A.: *See—*
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Van Baerle, Edward. Photographic material processing module. 3,982,259, Cl. 354-329.000.

Van Benthuysen, John D.: *See—*
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van Brederode, Robert A.; and Steinkamp, Robert A., to Exxon Research and Engineering Company. Process for preparing finely divided polymers. 3,981,957, Cl. 260-878.00R.

Van Cott, Edgar L.: *See—*
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Van Dam, Max; and Gallo, Stephen Robert, to Polychrome Corporation. Silver halide photographic materials containing the addition products of lower alkylene oxides and organic polyamines as anti-fog compounds. 3,981,733, Cl. 96-67.000.

van de Plassche, Rudy Johan, to U.S. Philips Corporation. Precision current-source arrangement. 3,982,172, Cl. 323-1.000.

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van der Lely, Cornelis; van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 3,981,366.

van der Lely, Cornelis; van der Lely, Ary; and Bom, Cornelis Johannes Gerardus. Soil cultivator. 3,981,366, Cl. 172-59.000.

van der Ziel, Jan Peter, to Bell Telephone Laboratories, Incorporated. Phase matching in a laminar structure. 3,982,135, Cl. 307-88.300.

Vande Wiele, John L.: *See—*
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Veit, Herbert F., to Robertshaw Controls Company. Emergency breathing means. 3,981,302, Cl. 128-203.000.

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Velsicol Chemical Corporation: *See—*
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Venus Electric Limited: *See—*
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Vironda, Philip G. Method of treating ingrown nail. 3,981,298, Cl. 128-81.00R.

Visser, Peter J., to Clark Equipment Company. Outrigger. 3,981,514, Cl. 280-765.000.

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Voegeli, Otto, to International Business Machines Corporation. Hard-magnetic film overlay apparatus and method for magnetic mobile domain control. 3,982,234, Cl. 340-174.0TF.

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von Konig, Anita: *See—*
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Wada, Kenichi: *See—*
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Waehner, Glenn C., to United Technologies Corporation. Bipolar A/D converter using two comparators. 3,982,240, Cl. 340-347.0AD.

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Wald, Fritz, to Mobil Tyco Solar Energy Corporation. Light sensitive electronic devices. 3,982,260, Cl. 357-15.000.

Waldstein, David A. Bactericidal and fungicidal 1,3,5 trialkanol triazines. 3,981,998, Cl. 424-249.000.

Walker, James M.; Ilfrey, William T.; and Schaeffer, Philippe H., to Exxon Production Research Company. Marine riser. 3,981,357, Cl. 166-.500.

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Wallis, Jamie Malcolm. Core sampling drill. 3,981,371, Cl. 175-403.000.

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Walworth, Bryant Leonidas, to American Cyanamid Company. Herbicidal methods. 3,981,717, Cl. 71-105.000.

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Wang, Richard H. S.; and Zannucci, Joseph S., to Eastman Kodak Company. Multichromophoric benzotriazole ultraviolet stabilizers. 3,981,884, Cl. 260-308.00B.

Ward, Benjamin F.; and Vardell, William G., to Westvaco Corporation. Corrosion inhibiting compositions and process for inhibiting corrosion of metals. 3,981,682, Cl. 21-2.70R.

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Waring, Doyle. Combined valve and outage gauge. 3,981,324, Cl. 137-556.600.

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Warnow, Detlef; and Ziebrecht, Hans-Jorg, to Dragerwerk Aktiengesellschaft. Pneumatically controlled respiration device. 3,981,301, Cl. 128-145.800.

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Waters, James L.: *See—*
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Watson, Clarence V. Removable fluid holding tank for vehicle. 3,981,323, Cl. 137-344.000.
Watson, Donald W., to Xerox Corporation. Demand label transfer wheel. 3,981,499, Cl. 271-276.000.
Watson, Kenneth, to Westland Aircraft Limited. Disconnect coupling for drive shafts. 3,981,158, Cl. 64-6.000.
Watson, Richard Dean: *See—*
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Watts, Horace, to H. & D. E. Watts Limited. Water mixing tap. 3,981,330, Cl. 137-636.400.
Weaver, Mary Ollidene; Bagley, Edward B.; Fanta, George F.; and Doane, William M., to United States of America, Agriculture. Highly absorbent starch-containing polymeric compositions. 3,981,100, Cl. 47-58.000.
Weaver, Merle L.; Huxsoll, Charles C.; and Graham, Robert P., to United States of America, Agriculture. Peeling fruits and vegetables by multiple heatings and coolings. 3,982,037, Cl. 426-482.000.
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Weiss, Gerhard, to BBC Brown Boveri & Company Limited. Method for starting a steam-heated heat exchanger by regulating the pressure of the heating-steam. 3,981,444, Cl. 236-1.00R.
Weiss, Joel A.; and Sheridan, James P., to United States of America, Navy. Optically activated exciplex shutter/attenuator. 3,981,561, Cl. 350-160.00P.
Weiss, Jonas: *See—*
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Westover, Marvin D. Rear wheel steering system. 3,981,512, Cl. 280-81.500.
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White, Kenneth N. Rotatable base unit for a router for trimming laminate plastics. 3,981,226, Cl. 90-12.00D.
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Williams, Gardner R., to Stanley Works, The. Door operator. 3,981,203, Cl. 74-25.000.
Williams, Irving. Oxygen supply systems for aircraft. 3,981,300, Cl. 128-142.00R.
Williams, Malcolm; Crookes, Richard William; and Jones, Christopher Robin, to C.A.V. Limited. Fuel systems for engines. 3,981,287, Cl. 123-139.00E.
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Williamson, Donald Farrington. Free standing fryer. 3,981,232, Cl. 99-337.000.
Willim, Fritz, to Concast AG. Method and apparatus for strand cooling with a flat spray pattern. 3,981,347, Cl. 164-89.000.
Wilson, Alfred P., to Standard Oil Company (Indiana). Lubricant for polyvinyl chloride. 3,981,838, Cl. 260-31.600.
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Wilson, Richard Arnold; Katz, Ira; Vock, Manfred H.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Flavoring with 2,4,6-trimethyl-s-trithiane. 3,982,034, Cl. 426-535.000.
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Winchell, Harry S.; Wells, Dale K.; Lamb, James F.; and Beaudry, Samuel B., to Medi-Physics, Inc. Process for preparing fluorine-18. 3,981,769, Cl. 176-11.000.
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Wirtanen, Theodore E., to United States of America, Air Force. Means and method for determining meridian location and azimuth. 3,981,588, Cl. 356-152.000.

Wisotsky, Max J.; and Tunkel, Norman, to Exxon Research and Engineering Company. Process for preparing copolymers of ethylene and vinyl esters or mixtures with other ethylenically unsaturated monomers. 3,981,850, Cl. 526-227.000.

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Yamamoto, Sadanori; and Osada, Isao, to Joto Chemical Company Limited. Method for molding thermoplastic resin compositions. 3,981,840, Cl. 260-42.000.

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Yamashita, Hajime, to Ricoh Co., Ltd. Method and a system for concurrently copying both sides of an original. 3,981,580, Cl. 355-24.000.

Yamato, Yukiomi: *See—*
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Yates, David J. C., to Exxon Research and Engineering Company. Regeneration of iridium-containing catalysts. 3,981,823, Cl. 252-415.000.

Yeomans, Bertram: *See—*
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Yocom, Perry Niel; and Dismukes, John Pickett, to RCA Corporation. Luminescent sulfides of monovalent and trivalent cations. 3,981,819, Cl. 252-301.40S.

Yokomizo, Hiroshi: *See—*
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Yonezu, Kunio; Tsubota, Masaharu; and Asai, Kenji, to Japan Storage Battery Co., Ltd. High power lead acid battery. 3,981,742, Cl. 429-123.000.

Yoshizaki, Hiroyuki; Takanohashi, Hiromitsu; Masuda, Yoshitaka; Hozumi, Yukio; Ohi, Akira; and Sonoyama, Yuzo, to Daicel, Ltd.; and Mitsubishi Gas Chemical Company, Inc. Impact-resistant, flame-retardant resin composition. 3,981,843, Cl. 260-45.75B.

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Zabransky, Robert F., to Universal Oil Products Company. HF alkylation process and reaction temperature control system. 3,981,942, Cl. 260-683.480.

Zalesak, Joseph F.: *See—*
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Zhidkov, Boris Alexeevich, deceased: *See—*
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Ziemek, Peter, to Bayer Aktiengesellschaft. Process for the preparation of heterocyclic compounds. 3,981,869, Cl. 260-240.00G.

Zimmer, George A.; and Struttmann, Hilarius S., to Borg-Warner Corporation. Bearing improvement. 3,981,550, Cl. 308-194.000.

Zimmerman, Otto J.; and Mock, Walton L., to Smico Corporation. Oscillating free swinging sifter apparatus. 3,981,403, Cl. 209-366.500.

Zito, Santo, to Fairmont Foods Company. Process for coating pizza shells with sauce. 3,982,033, Cl. 426-302.000.

Zletz, Alex, to United States of America, Air Force. Silicone fluids as a corrosion inhibitor for perfluorinated polyether fluids. 3,981,811, Cl. 252-49.600.

Zletz, Alex, to United States of America, Air Force. High temperature thermally stable greases. 3,981,812, Cl. 252-49.600.

Zlupko, John E., to General Electric Company. Method of making an insulator with a non-linear resistivity coating of glass bonded silicon carbide. 3,982,048, Cl. 427-126.000.

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Zuech, Ernest A., to Phillips Petroleum Company. Solid olefin reaction catalyst and method of using same. 3,981,940, Cl. 260-683.00D.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF SEPTEMBER, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Incorporated: *See*—
Welstead, William J., Jr., Re. 28,973.

Aizu, Keiichiro: *See*—
Kumada, Akio; Aizu, Keiichiro; and Furuhata, Yoshio, Re. 28,971.

Blockwick, Thomas Nicholas, to Ocean Systems, Inc. System and barrier for containing an oil spill. Re. 28,966, Cl. 61-1.00F.

Boehringer Ingelheim GmbH: *See*—
Weber, Karl-Heinz; Merz, Herbert; Zeile, Karl; Giesemann, Rolf; and Danneberg, Peter, Re. 28,972.

Buzzetta, Frank Vincent: *See*—
Rothman, Julius; Tacconelli, Edmond Andrew; and Buzzetta, Frank Vincent, Re. 28,975.

Cabot Corporation: *See*—
Morgan, Allan C.; and Jordan, Merrill E., Re. 28,974.

Danneberg, Peter: *See*—
Weber, Karl-Heinz; Merz, Herbert; Zeile, Karl; Giesemann, Rolf; and Danneberg, Peter, Re. 28,972.

Devron Engineering Ltd.: *See*—
Dove, Norman F., Re. 28,968.

Dove, Norman F., to Devron Engineering Ltd. Steam supply apparatus. Re. 28,968, Cl. 137-608.000.

Furuhata, Yoshio: *See*—
Kumada, Akio; Aizu, Keiichiro; and Furuhata, Yoshio, Re. 28,971.

Giesemann, Rolf: *See*—
Weber, Karl-Heinz; Merz, Herbert; Zeile, Karl; Giesemann, Rolf; and Danneberg, Peter, Re. 28,972.

Hamilton, William H., to Pennwalt Corporation. Flow through type drying apparatus. Re. 28,965, Cl. 34-92.000.

Hitachi, Ltd.: *See*—
Kumada, Akio; Aizu, Keiichiro; and Furuhata, Yoshio, Re. 28,971.

Jordan, Merrill E.: *See*—
Morgan, Allan C.; and Jordan, Merrill E., Re. 28,974.

Kabushiki Kaisha Seisan Nihon Sha Ltd.: *See*—
Naito, Kakuji, Re. 28,969.

Kumada, Akio; Aizu, Keiichiro; and Furuhata, Yoshio, to Hitachi, Ltd. Light modulator element. Re. 28,971, Cl. 350-150.000.

Merz, Herbert: *See*—
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Morgan, Allan C.; and Jordan, Merrill E., to Cabot Corporation. Process for making carbon black. Re. 28,974, Cl. 423-450.000.

Naito, Kakuji, to Kabushiki Kaisha Seisan Nihon Sha Ltd. Integral reclosable bag. Re. 28,969, Cl. 150-3.000.

Ocean Systems, Inc.: *See*—
Blockwick, Thomas Nicholas, Re. 28,966.

Pennwalt Corporation: *See*—
Hamilton, William H., Re. 28,965.

Rothman, Julius; Tacconelli, Edmond Andrew; and Buzzetta, Frank Vincent. Flexible welding nozzle apparatus. Re. 28,975, Cl. 219-130.000.

Shapiro, Justin J. Liquid dispensing device. Re. 28,970, Cl. 222-50.000.

Tacconelli, Edmond Andrew: *See*—
Rothman, Julius; Tacconelli, Edmond Andrew; and Buzzetta, Frank Vincent, Re. 28,975.

Weber, Karl-Heinz; Merz, Herbert; Zeile, Karl; Giesemann, Rolf; and Danneberg, Peter, to Boehringer Ingelheim GmbH. 5-Aryl-1H-1,5-benzodiazepine-2,4-diones. Re. 28,972, Cl. 260-239.30B.

Weiss, Dieter, to Weiss KG. Work locating apparatus. Re. 28,967, Cl. 92-14.000.

Weiss KG: *See*—
Weiss, Dieter, Re. 28,967.

Welstead, William J., Jr., to A. H. Robins Company, Incorporated. 3-(Omega-substituted alkyl)-indoles. Re. 28,973, Cl. 260-293.610.

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Weber, Karl-Heinz; Merz, Herbert; Zeile, Karl; Giesemann, Rolf; and Danneberg, Peter, Re. 28,972.

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Agate, Donald L. Contoured handle. 241,508, 9–21–76, Cl. D8—147.

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Allstar Verbrauchsguter GmbH & Co. KG: *See*—
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Asano, Tamoru, to Sanwa Cutlery Co., Ltd. Disposoble razor. 241,583, 9–21–76, Cl. D95—3.

Beall, Glenn L.: *See*—
Ettlinger, Ralph, Jr., and Beall. 241,493.

Bertagni Electroacoustic Systems, Inc.: *See*—
Bertagni, Jose J., and Metz. 241,554.

Bertagni, Jose J., and H. M. Metz, to Bertagni Electroacoustic Systems, Inc. Speaker enclosure. 241,554, 9–21–76, Cl. D26—14.

Blalock, Delmas H. Toaster. 241,497, 9–21–76, Cl. D7—91.

Blodee, Leif, to The Gunlocke Co. Design for a combined seat, table planter and multiple bench unit, or similar article. 241,485, 9–21–76, Cl. D6—4.

Blue, Thomas R. Child's flexion wheelchair. 241,529, 9–21–76, Cl. D12—131.

Bogan, Robert T. Decorative panel or the like. 241,534, 9–21–76, Cl. D25—85.

Boldt, Melvin H., and D. P. Chuboff, to Zenith Radio Corp. Combined phonograph and tuner. 241,573, 9–21–76, Cl. D56—4.

Bourassa, Joseph R., and M. Lopez, to Parker-Hannifin Corp. Vehicle door mirror mounting bracket. 241,532, 9–21–76, Cl. D12—187.

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Castano, Jose P., to Jose Paredes, S.L. Tread for footwear. 241,484, 9–21–76, Cl. D2—320.

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Condos, Peter J. Chain and hook lock. 241,507, 9–21–76, Cl. D8—137.

Cone, George W.: *See*—
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Ettlinger, Ralph, Jr., and Beall. 241,493.

England, Will C. Vine planter. 241,567, 9–21–76, Cl. D11—152.

Ettlinger, Ralph, Jr., and G. L. Beall, to Economics Laboratory, Inc. Modular floor mat. 241,493, 9–21–76, Cl. D6—209.

Felske, Arthur M., to General Electric Co. Clock or similar article. 241,523, 9–21–76, Cl. D10—23.

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41R 3,981,278
41.14 3,981,279
69R 3,981,280
90.6 3,981,281
117R 3,981,282
119A 3,981,283
3,981,284
119C 3,981,285
139AJ 3,981,286
139AW 3,981,288
139E 3,981,287
182 3,981,289

CLASS 124
24R 3,981,290

CLASS 126
110R 3,981,291
121 3,981,292
271 3,981,293
3,981,294
3,981,295
343.5R 3,981,296

CLASS 127
25 3,981,738
60 3,981,739

CLASS 128
2G 3,981,297
81R 3,981,298
142R 3,981,300
145.8 3,981,301
203 3,981,302
260 3,981,303
269 3,981,304
285 3,981,305
287 3,981,306
339 3,981,307
346 3,981,308
349B 3,981,299
419P 3,981,309
464 3,981,310

CLASS 131
144 3,981,311

CLASS 132
7 3,981,312
9 3,981,313
3,981,314

CLASS 134
2 3,981,740
6 3,981,741
167R 3,981,315

CLASS 136
202 3,981,750
225 3,981,751

CLASS 137
73 3,981,316
75 3,981,317
86 3,981,318
211 3,981,319
240 3,981,320
255 3,981,321
318 3,981,322
344 3,981,323
556.6 3,981,324
587 3,981,325
654 3,981,326
608 Re.28,968
613 3,981,327
614.2 3,981,328
615 3,981,329
636.4 3,981,330

CLASS 139
54 3,981,331
449 3,981,332

CLASS 140
1 3,981,333

CLASS 141
46 3,981,334
3,981,335

CLASS 144
3D 3,981,336
241 3,981,337
309D 3,981,338

CLASS 148
12B 3,981,752
23 3,981,753
155 3,981,754
171 3,981,755

CLASS 149
19.3 3,981,756

CLASS 150
3 Re.28,969
36 3,981,339
52R 3,981,340

CLASS 152
158 3,981,341
347 3,981,342

CLASS 156
8 3,981,757
64 3,981,758
73.5 3,981,759
110A 3,981,760
235 3,981,761
322 3,981,762
352 3,981,763
622 3,981,764

CLASS 160
9 3,981,343

CLASS 162
80 3,981,765
161 3,981,766
198 3,981,767

199 3,981,768

CLASS 164

26 3,981,344
49 3,981,345
60 3,981,346
89 3,981,347
149 3,981,348
252 3,981,349
283R 3,981,350
3,981,351
332 3,981,353
358 3,981,352

CLASS 165

2 3,981,355
79 3,981,354
179 3,981,356

CLASS 166

.5 3,981,357
224A 3,981,358
224R 3,981,360
241 3,981,359
252 3,981,361
260 3,981,362
270 3,981,363
311 3,981,364

CLASS 171

63 3,981,365

CLASS 172

59 3,981,366
265 3,981,367

CLASS 173

104 3,981,368

CLASS 174

2 3,982,058
73R 3,982,059
75C 3,982,060

CLASS 175

5 3,981,369
373 3,981,370
403 3,981,371

CLASS 176

11 3,981,769
37 3,981,770

CLASS 178

2R 3,982,061
5.1 3,982,062
5.6 3,982,064
5.8R 3,982,065
6 3,982,063
6.6R 3,982,066
7.1 3,982,067
7.2 3,982,068

CLASS 179

1GQ 3,982,069
3,982,071
1SM 3,982,070
2TC 3,982,072
7.1R 3,982,073
15AT 3,982,076
15BS 3,982,075
15BV 3,982,074
3,982,077
81R 3,982,078
3,982,079
170D 3,982,080

CLASS 180

5R 3,981,372
3,981,373
14A 3,981,374
69C 3,981,375
70P 3,981,376

CLASS 181

36A 3,981,377
50 3,981,378
118 3,981,379

CLASS 188

282 3,981,380

CLASS 192

70.18 3,981,381
150 3,981,382

CLASS 194

102 3,981,384

CLASS 195

1.3 3,981,771
1.4 3,981,772
31R 3,981,773
49 3,981,774
68 3,981,775
103.5R 3,981,776
3,981,777

CLASS 197

17 3,981,385
18 3,981,386
63 3,981,383
168 3,981,387
189 3,981,388

CLASS 198

308 3,981,391
377 3,981,392
379 3,981,393
391 3,981,394
655 3,981,389
844 3,981,390

CLASS 200

5R 3,982,081
44 3,982,082
48A 3,982,083
51.09 3,982,084
61.41 3,982,085
67DA 3,982,086
84C 3,982,087
144B 3,982,088
159B 3,982,089
291 3,982,090

CLASS 202

263 3,981,778

CLASS 203

7 3,981,779
3,981,780

CLASS 204

16 3,981,781
46G 3,981,782
59F 3,981,783
105R 3,981,784
195S 3,981,785
224M 3,981,786
252 3,981,787
266 3,981,745
3,981,788
272 3,981,789
286 3,981,790
298 3,981,791

CLASS 206

82 3,981,395
15.2 3,981,399
109 3,981,396
178 3,981,397
223 3,981,398
407 3,981,400
508 3,981,401
534.2 3,981,402

CLASS 208

49 3,981,792
108 3,981,793
138 3,981,794
139 3,981,795
215 3,981,796
309 3,981,797
323 3,981,798

CLASS 209

366.5 3,981,403
457 3,981,799

CLASS 210

6 3,981,800
31C 3,981,801
91 3,981,802
178 3,981,803
516 3,981,804

CLASS 211

1.3 3,981,404
70 3,981,405

CLASS 214

6FS 3,981,406
8.5E 3,981,407
506 3,981,408

CLASS 219

101 3,982,091
130 Re.28,975
203 3,982,092
216 3,982,093
3,982,094
273 3,982,095
403 3,982,096
486 3,982,097
501 3,982,098
544 3,982,099
553 3,982,100

CLASS 220

5R 3,981,409
6 3,981,410
267 3,981,411
270 3,981,412
334 3,981,413

CLASS 222

38 3,981,414
50 Re.28,970
95 3,981,415
146R 3,981,416
193 3,981,417
386.5 3,981,418
404 3,981,419
505 3,981,420
521 3,981,421

CLASS 225

2 3,981,422

CLASS 226

42 3,981,423

CLASS 227

10 3,981,424
155 3,981,425

CLASS 228

118 3,981,426
122 3,981,427
175 3,981,428
194 3,981,429

CLASS 229

17R 3,981,430
34HW 3,981,431
37R 3,981,432
51BP 3,981,433
51TS 3,981,434
69 3,981,435

CLASS 232

17 3,981,436

CLASS 233

11 3,981,437
26 3,981,438

CLASS 235

61.6E 3,982,102
61.7B 3,982,103
88N 3,982,104
91R 3,981,439
92DN 3,982,105
3,982,107
92EA 3,982,108
92FQ 3,981,440
92GC 3,982,106
103 3,981,441
150.2 3,981,442
150.3 3,982,109
151.3 3,982,110
152 3,982,101
153AM 3,982,111
156 3,981,443
3,982,112
181 3,982,113
3,982,114
197 3,982,115

CLASS 236

1R 3,981,444

CLASS 237

1A 3,981,445

CLASS 239

1 3,981,446
124 3,981,447
127.3 3,981,448
3,981,449
265.31 3,981,450
3,981,451
542 3,981,452

CLASS 240

1.3 3,982,116
3,982,117
7.1LJ 3,982,121
7.1R 3,982,118
7.25 3,982,119
10.6R 3,982,120
152 3,982,122

CLASS 241

21 3,981,453
24 3,981,454
32 3,981,455
46R 3,981,456
46.17 3,981,457

CLASS 242

43R 3,981,458
75.44 3,981,459

CLASS 244

13 3,981,460
17.13 3,981,461
100A 3,981,462
110B 3,981,463
114R 3,981,464
122A 3,981,465
134R 3,981,466
158 3,981,467

CLASS 248

167 3,981,468
235 3,981,469
291 3,981,470
317 3,981,471
358R 3,981,472
430 3,981,473
487 3,981,474
500 3,981,475

CLASS 249

42 3,981,476
135 3,981,477

CLASS 250

227 3,982,123
237R 3,982,124
253 3,982,125
272 3,982,126
273 3,982,127
363S 3,982,128
364 3,982,129
373 3,982,130
390 3,982,131
456 3,982,132
493 3,981,805
505 3,982,133
506 3,982,134

CLASS 251

29 3,981,478
63.6 3,981,479
129 3,981,480
144 3,981,481
152 3,981,482

CLASS 252

8.1 3,981,806
8.8 3,981,807
32.7E 3,981,809
3,981,810
33.3 3,981,808
49.6 3,981,811
3,981,812
62.52 3,981,844
75 3,981,813
107 3,981,814
182 3,981,815
299 3,981,816
3,981,817
300 3,981,818
301.16 3,981,820
301.4S 3,981,819
316 3,981,821
403 3,981,822
415 3,981,823
3,981,824
455R 3,981,825
526 3,981,826

CLASS 254

76 3,981,483
148 3,981,484
186R 3,981,485

CLASS 256

13.1 3,981,486

CLASS 259

4R 3,981,487
72 3,981,488

CLASS 260

2.5AC 3,981,828
3,981,829
2.5AM 3,981,831
2.5AN 3,981,827
2.5EP 3,981,832
2.5HA 3,981,830
9 3,981,833
17R 3,981,834
29.6NR 3,981,835
29.6H 3,981,836
29.7SQ 3,981,837
31.6 3,981,838
33.6R 3,981,839
42 3,981,840
42.18 3,981,841
45.75B 3,981,842
3,981,843
69R 3,981,845
78TF 3,981,847
117 3,981,857
201 3,981,858
205 3,981,859
239BC 3,981,864
239.1 3,981,865
3,981,866
239.3B Re.28,972
239.55A 3,981,867
240G 3,981,869
240J 3,981,868
242 3,981,870
243R 3,981,871
247.2A 3,981,872
289H 3,981,873
293.54 3,981,874
3,981,875
293.61 Re.28,973
293.62 3,981,876
3,981,877
293.73 3,981,878
294.9 3,981,879
295M 3,981,881
295.5R 3,981,882
304A 3,981,883
308B 3,981,884
309 3,981,885
309.2 3,981,886
327P 3,981,887
332.2A 3,981,888
340 3,981,889
340.5 3,981,890
340.9 3,981,891
343.2R 3,981,892
345.8 3,981,893
397.1 3,981,894
404.8 3,981,895
429R 3,981,896
440 3,981,897
448.8R 3,981,898
465.5R 3,981,899
465.8D 3,981,900
468D 3,981,880
3,981,902
468E 3,981,901
468H 3,981,903
471C 3,981,904
473R 3,981,905
488H 3,981,906
497R 3,981,907
502A 3,981,908
516 3,981,909
520C 3,981,910
530N 3,981,911
553R 3,981,912
556F 3,981,913
557R 3,981,914
566A 3,981,915
570.8TC 3,981,916
586C 3,981,917
586R 3,981,918
3,981,919
593R 3,981,921
596 3,981,922
598 3,981,923
604HF 3,981,924
610D 3,981,925
614F 3,981,926
615F 3,981,927
621K 3,981,928
635R 3,981,929
635Y 3,981,931
645 3,981,930
3,981,932
3,981,933
3,981,934
3,981,935
651R 3,981,936
655 3,981,937
657 3,981,938
658R 3,981,939
683D 3,981,940
683.15D 3,981,941
683.48 3,981,942
878R 3,981,957
3,981,958
880R 3,981,943
3,981,944
900 3,981,945

CLASS 261

64R 3,981,946

CLASS 264

36 3,981,947
40.7 3,981,948
41 3,981,949
109 3,981,950
140 3,981,951
142 3,981,959
147 3,981,952
163 3,981,953
240 3,981,954
255 3,981,955
275 3,981,956

CLASS 266

80 3,981,489
169 3,981,490

CLASS 269

64 3,981,491
328 3,981,492

CLASS 271

10 3,981,493
3,981,494
18.3 3,981,495
80 3,981,496
126 3,981,497
193 3,981,498
276 3,981,499

CLASS 272

85 3,981,500

CLASS 273

55R 3,981,501
73F 3,981,504
73G 3,981,502
136K 3,981,503
157R 3,981,505
3,981,506
164 3,981,507
200B 3,981,508

CLASS 279

1R 3,981,509

CLASS 280

33.99H 3,981,510
79.3 3,981,511
81.5 3,981,512
95R 3,981,513
166 3,981,515
263 3,981,516
478R 3,981,517
730 3,981,518
744 3,981,519
748 3,981,520
760 3,981,521
765 3,981,514

CLASS 281

34 3,981,522

CLASS 282

27.5 3,981,523

CLASS 292

31 3,981,524
259R 3,981,525

CLASS 294

25 3,981,526
99R 3,981,527
3,981,528

CLASS 296

23C 3,981,529
35R 3,981,530
137G 3,981,531

CLASS 297

42 3,981,532
173 3,981,533
219 3,981,534
389 3,981,535
444 3,981,536
452 3,981,537
454 3,981,538

CLASS 298

35M 3,981,539

CLASS 299

62 3,981,540

CLASS 302

11 3,981,541

CLASS 303

20 3,981,542
21AF 3,981,543
3,981,544
21EB 3,981,545

CLASS 307

88.3 3,982,135
3,982,136
136 3,982,137
205 3,982,138
228 3,982,139
279 3,982,140
296 3,982,141

CLASS 308

5R 3,981,546
98 3,981,547
194 3,981,550
226 3,981,548
235 3,981,549

CLASS 310

8.2 3,982,142
9.1 3,982,143
9.6 3,982,144
89 3,982,146

CLASS 312

250 3,981,551
3,981,552
347 3,981,553

CLASS 313

274 3,982,145
309 3,982,147
330 3,982,148
366 3,982,149
398 3,982,150
465 3,982,151

CLASS 315

3.6 3,982,152
8 3,982,153
51 3,982,154
169TV 3,982,155
400 3,982,156

CLASS 316

2 3,981,554

CLASS 317

2J 3,982,157
9R 3,982,158
101CC 3,982,159

CLASS 318

7 3,982,160
52 3,982,164
257 3,982,161
313 3,982,162
473 3,982,163
568 3,982,165
696 3,982,166

CLASS 321

61 3,982,167
69R 3,982,168

CLASS 322

28 3,982,169
47 3,982,170

CLASS 323

1 3,982,171
3,982,172
17 3,982,173
3,982,174
18 3,982,175

CLASS 324

6 3,982,176
13 3,982,177
34R 3,982,178
43G 3,982,179
51 3,982,180
66 3,982,181
71CP 3,982,182
3,982,183
83 3,982,184

CLASS 325

344 3,982,186
457 3,982,187
470 3,982,188

CLASS 328

27 3,982,189
110 3,982,190
124 3,982,191
129 3,982,192
151 3,982,193
155 3,982,194

CLASS 329

50 3,982,195

CLASS 330

9 3,982,196
33 3,982,197

CLASS 331

27 3,982,198
51 3,982,199
94.5D 3,982,204
94.5G 3,982,205
3,982,208
3,982,209
94.5H 3,982,207
94.5P 3,982,200
3,982,201
94.5Q 3,982,203
94.5S 3,982,202
94.5T 3,982,206
109 3,982,210

CLASS 332

30V 3,982,211

CLASS 333

7D 3,982,212
31A 3,982,213
31R 3,982,214
73W 3,982,215

CLASS 335

112 3,982,216
207 3,982,217

CLASS 338

22R 3,982,218
96 3,982,219
174 3,982,220
202 3,982,221

CLASS 339

105 3,981,555
144R 3,982,185
275T 3,981,556

CLASS 340

2 3,982,222
8L 3,982,223
18NC 3,982,224
58 3,982,225
146.1AL 3,982,226
146.3AE 3,982,227
147R 3,982,236
172.5 3,982,228
3,982,229
3,982,230
3,982,231
3,982,232

174DC 3,982,233
174PW 3,982,235
174TF 3,982,234
237.5 3,982,237
279 3,982,238
324M 3,982,239
347AD 3,982,240
347CC 3,982,241
409 3,982,242

CLASS 343

6.5R 3,982,243
16M 3,982,244
100LE 3,982,245
112C 3,982,246
766 3,982,247
840 3,982,248
841 3,982,249
872 3,982,250

CLASS 346

1 3,982,251

CLASS 350

104 3,981,557
150 Re.28,971
160LC 3,981,558
3,981,559
160P 3,981,561
160R 3,981,560
162SF 3,981,562
214 3,981,563
255 3,981,564
266 3,981,565
285 3,981,566
307 3,981,567
317 3,981,568

CLASS 351

47 3,981,569

CLASS 352

12 3,981,570
112 3,981,572
125 3,981,571

CLASS 353

15 3,981,573
101 3,981,574

CLASS 354

1 3,982,252
4 3,982,253
53 3,982,254
70 3,982,255
253 3,982,256
286 3,982,257
300 3,982,258
329 3,982,259

CLASS 355

1 3,981,575
3R 3,981,085
4 3,981,576
3,981,577
16 3,981,578
18 3,981,579
24 3,981,580
44 3,981,581
75 3,981,582

100 3,981,583

CLASS 356

70 3,981,584
87 3,981,585
97 3,981,586
127 3,981,589
152 3,981,587
3,981,588
178 3,981,590
201 3,981,591
237 3,981,592
239 3,981,593
246 3,981,594

CLASS 357

15 3,982,260
16 3,982,261
17 3,982,262
22 3,982,263
3,982,264
30 3,982,265
44 3,982,266
52 3,982,267
55 3,982,268
60 3,982,269
3,982,270
81 3,982,271

CLASS 358

4 3,982,272
27 3,982,273
41 3,982,274

CLASS 360

1 3,982,275
17 3,982,276
27 3,982,277

CLASS 401

48 3,981,595
3,981,596
190 3,981,597

CLASS 403

28 3,981,598
107 3,981,599
318 3,981,600

CLASS 404

68 3,981,601
71 3,981,602
98 3,981,603

CLASS 408

72B 3,981,604
88 3,981,605
124 3,981,606
146 3,981,607

CLASS 415

15 3,981,608
117 3,981,609
291C 3,981,610

CLASS 416

61 3,981,611
66 3,981,612
142 3,981,613
180 3,981,614
190 3,981,615
215 3,981,623

233 3,981,616
244B 3,981,617

CLASS 417

12 3,981,618
38 3,981,619
42 3,981,620
44 3,981,621
46 3,981,622
53 3,981,624
63 3,981,625
89 3,981,626
207 3,981,627
247 3,981,628
269 3,981,629
3,981,630
312 3,981,631
413 3,981,632
474 3,981,633
499 3,981,634
551 3,981,635
566 3,981,636

CLASS 418

22 3,981,637
34 3,981,638
49 3,981,639
51 3,981,640
61R 3,981,641
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41 : 3,981,323
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42 : Re.28,965
3,981,061
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49 : 3,981,297
50 : 3,981,087
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51 : Re.28,966
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53 : 3,981,152
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1 : 241,563	241,545	241,532	241,536	26 : 241,533	39 : 241,535
6 : 241,487	241,549	241,583	241,573	27 : 241,528	241,560
241,496	241,550	241,584	18 : 241,510	241,539	241,566
241,503	241,551	12 : 241,491	241,552	241,565	241,570
241,505	241,553	241,508	19 : 241,526	35 : 241,534	42 : 241,509
241,506	241,554	241,555	241,569	36 : 241,494	241,530
241,507	241,580	13 : 241,564	241,571	241,517	241,561
241,514	241,581	16 : 241,579	20 : 241,498	241,537	48 : 241,567
241,516	8 : 241,486	17 : 241,489	241,578	241,538	51 : 241,499
241,519	241,531	241,490	21 : 241,542	241,546	53 : 241,500
241,520	9 : 241,512	241,493	23 : 241,518	241,548	241,582
241,529	241,513	241,501	24 : 241,559	241,562	55 : 241,488
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241,541	241,524	241,525	241,515	241,511	

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U.S. DEPARTMENT OF COMMERCE
Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*